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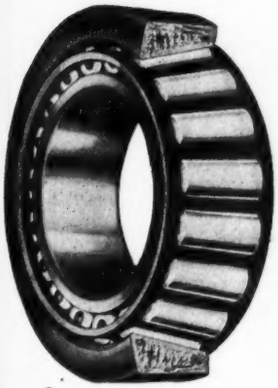

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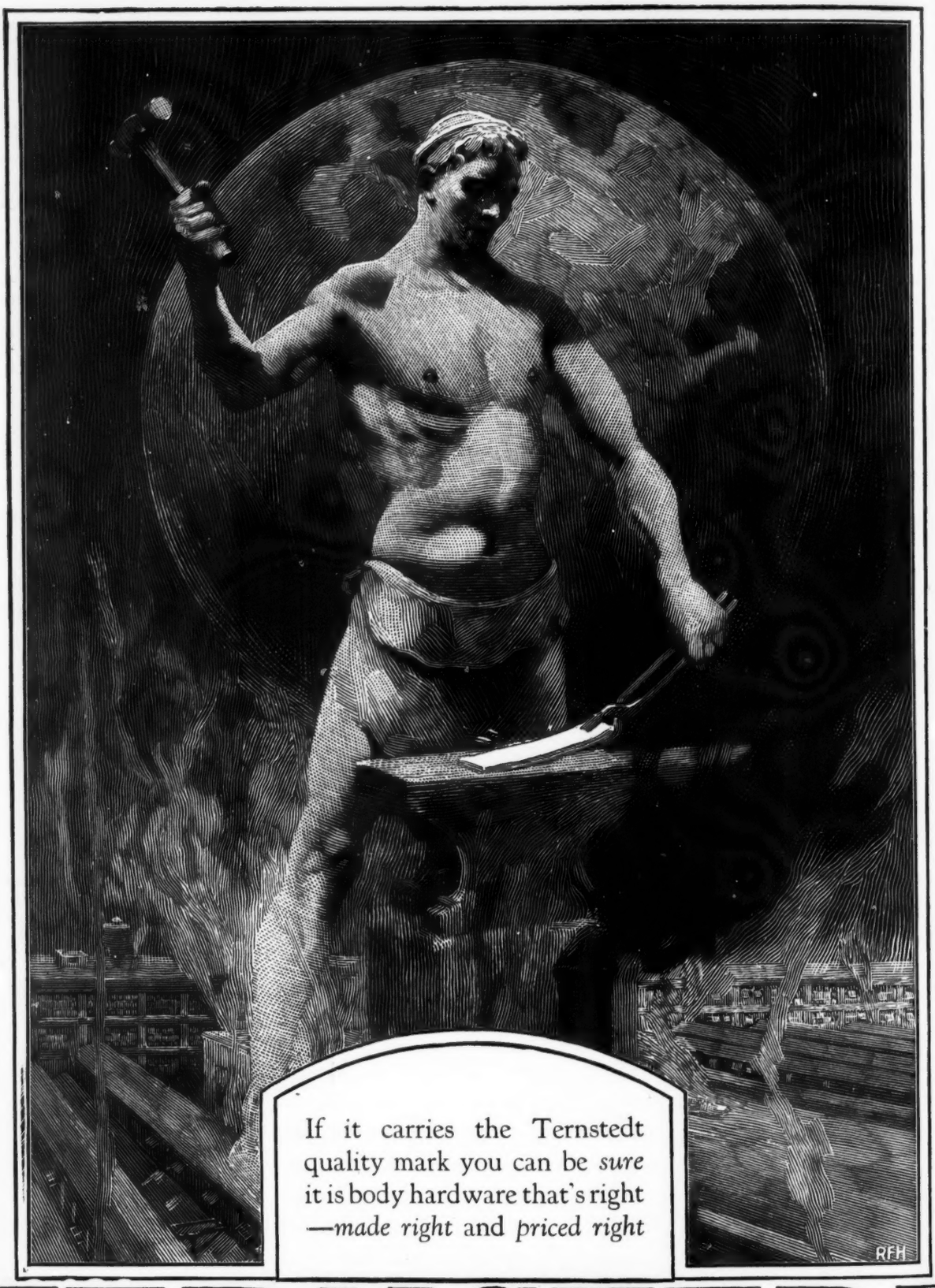

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. 51 NEW YORK—THURSDAY, AUGUST 21, 1924 No. 8

Has the Neighborhood Dealer Come to Stay?

Merchants in other lines are making it easy for the public to buy.
Automotive industry should do the same, car makers say.
Evils in present system must be wiped out.

By Norman G. Shidle

"THERE are too many sub-dealers in our big cities," dealers are crying in many parts of the country.

"We must have more distribution points," manufacturers are saying.

We all are in the automotive business and a way must be found to make the distribution of cars work satisfactorily to all concerned. Three viewpoints are involved in the question and any answer to it must embody three essentials:

Convenience in buying and service for the public.
Reasonable profits for the dealer.
Maximum profitable distribution for the manufacturer.

Each of these elements must be provided if the distribution system is to be satisfactory to the public, the dealer and the manufacturer. It is the difficulty of getting them all at the same time that has caused so much dissatisfaction with present conditions.

Both dealers and manufacturers will agree that the basis of any solution must be service to the well-known public.

In the light of marketing developments in other lines of business, it would look as though the neighborhood automobile sales establishment has come to stay. Whether it will be a sub-dealer or a branch, or how many retail distribution points there should be in any given city, may be dismissed for the moment.

It is easy to confuse main issues by hit-or-miss discussion of minor troubles or specific difficulties arising out of a fundamentally sound trend. There can be no question about the evils that have sprung up as a result of a too numerous and hasty sprinkling about of sub-dealers in certain urban areas. But these may constitute rather the inefficient working out of a conception that is in line with general marketing trends rather than any fallacy in the idea itself.

THE neighborhood store has become an established institution in many lines of retailing. It has been common in the grocery, hardware and other trades for a long time. Even banks, those pillars of economic conservatism, have taken up actively the neighborhood branch idea in large cities during the last few years. This trend has continued primarily because it has been found profitable to cater to the convenience of the public. It has been found that a man will buy many products when they are within easy reach which he will do without if he has to travel several miles to purchase. Manufacturers and merchants in other lines of trade have proved this fact and have profited by making it easy for the public to buy.

A movement of this kind inevitably increases the cost of marketing. It provides for the manufacturer a greater numerical distribution, but it raises the unit cost of each sale. It is possible to cater to

the convenience of the public to such an extent that the catering costs more than it is worth. A point can be reached at which the cost of getting extra distribution is greater than the profits to be derived.

Working out of automobile distribution in large cities, then, must take full recognition of two factors:

> Added retail contacts will increase sales up to a certain point. That point passed, the cost of getting sales is so great as to render further sales undesirable from a profit standpoint.

Where Is the Danger Line?

Most of the present trouble has arisen through the inability of the factory to determine beforehand when the danger line is going to be reached for the dealers. The interests of the manufacturer and the dealer are not identical throughout the marketing effort, despite the fundamental and general mutuality of interest.

Suppose, for example, that a dealer can sell 100 cars at a net profit of 5 per cent. The second hundred he handles may require increased sales effort sufficient to reduce his profit on them to 3 per cent. On the third hundred he may make only 1 per cent, while the fourth hundred he handles may not yield any profit at all.

The dealer is not likely to consider it to his interest to make the effort necessary to sell the fourth hundred cars when there is likely to be no profit in them for him, while he won't care much whether or not he sells the third hundred, which yields him a meager 1 per cent.

But it is decidedly to the advantage of most manufacturers, present plant capacity considered, to get into the hands of owners that third and fourth hundred, because this added distribution helps materially to reduce overhead cost at the factory. If production capacity were somewhat behind demand, instead of being considerably ahead of it, this condition would not be acute, but the principle involved would remain true just the same. Better balance between demand and potential supply, however, would make it much easier to adjust the difference in interests.

SUCCESSFUL car merchandising results from a system which makes it possible for the average dealer to make some profit under most economic conditions. Any factory sales policy "so conceived and so dedicated will long endure."

The question, "How many sub-dealers are too many?" is being asked in many city territories.

It will have to be answered on the basis of facts and careful analysis before the idea of neighborhood stores can be worked into the marketing fabric of the automotive industry with entire success.

All merchandising has to be conducted through the medium of men—men who live and think and act largely in accordance with the dictates of personal interest. That personal interest often is benefited by helping others to satisfy their needs and desires, as well as by the pursuit of immediate ends by the individual, but the psychological reactions of human beings must be considered fully in laying out or in analyzing any sales plan.

Approaching his problem from this angle, the manufacturer is likely to find that he has far more to gain having his dealers make a profit on every unit they sell than from the reduced overhead to be derived from cars built and sold without profit to the distributing end of the business. The brick and mortar and machinery of the factory is very real to the manufacturer, while the abstract character of his merchandising work necessary makes its cost less vivid. It is only too easy to figure up how much it costs to have a machine idle, while it is almost impossible to put down in black and white how much it costs to have a dealer dissatisfied, lethargic and disgruntled. But the latter cost is none the less real because it is abstract.

Fuller recognition is being given to this fact daily. Many executives are beginning to approach their sales schedules from the standpoint of merchandising effort in the field rather than from that of the factory.

Profits and Psychology

This rather theoretical discussion of dealer psychology has a very direct bearing on the sub-dealer situation and its probable development. Dealers in general have not been making any overwhelming profits during the last year. The manufacturers can say justly "Neither have we," but that doesn't make the dealer any more satisfied with his lot. He wants a profit. Often he finds it very difficult to control the sub-dealers which the factory has demanded that he put in, and he can prove—to his own satisfaction, at least—that he might have made money if he hadn't been burdened with more distribution points than he knew what to do with. He can't be expected to get very enthusiastic about the theoretical phases of distributing policy. He is very human, like all the rest of us.

He sees his own sub-dealers out-trading him.

He sees himself stocking cars for the benefit of sub-dealers who avail him little in the way of profit.

He sees his profits dwindling with his territory.

He finds himself asked to take more cars than he thinks he can handle.

All of these things affect his morale. They have a very definite bearing on his effectiveness as a member of the factory sales organization.

So the establishment of numerous sub-dealers in cities, while it may be entirely sound in principle, must be so worked out in practice as to make the task of selling automobiles pleasant and profitable for dealers and sub-dealers alike.

Certain fundamentals are necessary to achieve this end:

1. Very careful study of potential markets as regards number of cars of all makes likely to be sold.
2. Reasonable estimate of cars of particular make likely to be sold.
3. Study of dealers' cost of doing business, cap-

ital investment, and probable profits figured on a definite but conservative basis.

4. Holding sub-distribution points to such a number as will permit profit for each one.
5. Recognition of the fact that the cost of establishing, changing and educating dealers and sub-dealers is very high and that stability in a dealer organization is worth real money to the factory. And realization that stability can be achieved only by having profit-making dealers.

Nobody can say how many sub-dealers should be put into any city without having done a lot of hard thinking and careful investigating along the lines just mentioned. Hasty allocation of territories has been one of the chief difficulties in the past.

There is a strong feeling in certain quarters that dealer branches will work out more effectively in the long run than will sub-dealers. The idea would be for dealers to maintain neat but low-priced salesrooms in various parts of their territory which would give them a retail contact convenient to people in every part of their territory but which would not run up their overhead to overwhelming proportions.

The increased capital necessary for the branch is, of course, one of the chief objections to it, but the possibility of better coordination and control of its activities constitutes a great offsetting advantage. Some manufacturers tend to favor sub-dealers rather than branches because of the greater credit and financial facilities usually resulting. If a dealer has enough money to handle the same number of cars through branches as the manufacturer can get into the territory through sub-dealers, however, probably there would be little dispute about the matter one way or the other.

Neighborhood Dealer Thought Permanent

The feeling among manufacturers in general is that the neighborhood dealer will be permanent. Some of the more disinterested admit many evils in the present situation, but say that people every day are demanding more convenience in buying. Other lines of business are making it possible for them to buy without effort, and the automobile business has to fall in line with this clear economic and social trend.

Despite various rumors which have been going the rounds for several weeks, there is no real indication that manufacturers have any intention of cutting down the number of sub-dealers in large towns. Readjustment probably will be made—certainly they should be where present conditions cause injustices—but manufacturers do not seem likely to change their policy basically.

Solution of the problem involves much more than mere number of retail distribution points. The relative sales efficiency of a large number of human beings is of major importance, while many other factors have a strong bearing of the question. The point of most immediate importance is that the discussion of the sub-dealer question be taken out of the realm of arguments and unsupported statements about superficial conditions into the clear atmosphere of exchange of opinion based on accurate fact studies and analytical thinking about fundamentals.

Whether careful studies of this kind are made or not, the inevitable workings of economic law finally will determine how many sub-dealers or branches are profitable in any given case.

If it is necessary to wait for experience to teach the industry everything it is going to know about proper handling of the neighborhood merchant situation, a lot of grief is in store for both manufacturers and dealers during the next few years. Even with very careful analysis of each territory and its individual problems, there will be plenty of things left which can be learned only by the cut-and-try method.

ARGUMENTS about immediate troubles sometimes obscure the fundamentals of a merchandising problem.

Because sub-dealers have caused certain retailers to lose money, some people have said, "The sub-dealer must go."

If the establishment of neighborhood stores is in line with a basic economic trend in marketing, the automobile industry, like every other, will have to follow it.

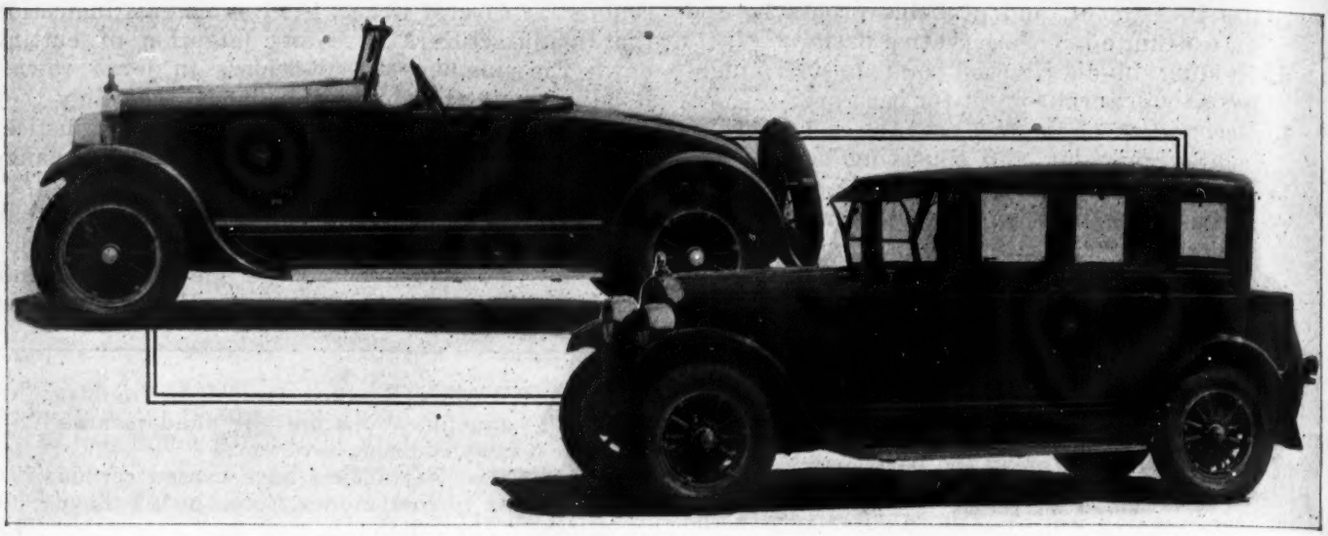
Lack of dealer profits, quite conceivably, may come from improper working out of the neighborhood store idea, rather than from any fallacy in the idea itself.

Ford Predicts Decentralization

THE passing of the great city in the near future is predicted by Henry Ford in a remarkable interview which will appear in AUTOMOTIVE INDUSTRIES in its issue of August 28.

In this interview Mr. Ford declares that high labor costs, excessive taxation and exorbitant real estate values will compel the big industries of the country to decentralize and scatter individual plants through villages and small towns of the rural districts.

The movement has already been begun at the mammoth Ford plant at Highland Park and Mr. Ford gives some deeply interesting details of the village industries which he has already established with striking reductions in costs and satisfied, instead of disgruntled workmen.



Two of the new Jordan "Line Eight" body models

Jordan Eight, Added to Lines of Sixes, Now in Production

Engine is conventional in most particulars, but has small flywheel to serve as vibration damper at front end. Crankshaft is carried in five bearings.

By Donald Blanchard

JORDAN'S new Line Eight now is in production in five body types, all mounted on a standard 125½-in. wheelbase chassis with a 3 x 4¾-in. engine. The new car is said to have a speed range in high gear of from 1 or 2 m.p.h. up to 68 or 72 m.p.h. and to give from 14 to 18 miles to the gallon of gasoline, depending on the conditions of operation.

The new models supplement the present six-cylinder line, which is continued without change. Prices on the two lines are as follows:

"Silhouette" Six	
Phaeton	$1,775
Blue Boy	2,095
Victoria	2,385
Brougham	2,385
Sedan	2,585

"Line" Eight	
Phaeton	$2,575
Playboy	2,575
Victoria	2,775
Brougham	2,875
Sedan	2,975

An L-head design is used in the new engine, which has a piston displacement of 268.6 cu. in. and an N. A. C. C. rating of 28.8 hp. The actual horsepower is said to be 74 at 3000 r.p.m. Cylinder block and detachable head are gray iron castings, while the crankcase is aluminum and the oil pan is pressed steel. The flywheel housing is bolted to the crankcase. The split in the crankcase comes about 2¾ in. below the center line of the crankshaft. This engine is manufactured for the Jordan company by Continental from dies, jigs and patterns which are the property of Jordan.

Four-point suspension is provided for the powerplant, the two rear supports being at the flywheel housing and the front supports on the timing case cover. The rear supports bolt to distance pieces attached to the frame side rails, while those in front rest on brackets supported by a frame cross-member.

A feature of the engine is a vibration dampener in the form of a small flywheel mounted on the front end of the crankshaft. This shaft, which is put in both static and dynamic balance, is carried in five babbitt bearings all 2⅜ in. in diameter and the following lengths: front, 1½ in.; intermediate, 1⅝ in.; rear, 2½ in.

Connecting rods are S. A. E. No. 1045 steel drop forgings with a center to center length of 10⅞ in. The rod caps each are secured with two chrome nickel steel bolts. Big end bearings are babbitt lined, the diameter and length being 2⅛ and 1½ in. respectively. The piston pins, which are secured in the pistons by snap rings and locking screws, have their bearings in phosphor bronze bushings in the rods. These pins are 55/64 in.

in diameter and are given a burnished finish. Pistons are of cast iron, 3¾ in. high, with three rings, all above the pin.

A No. 45 Morse chain is employed to drive camshaft and generator sprockets. The camshaft is a drop forging and is carried in five bearings of the following dimensions:

	Length	Diameter
Front	1 13/16 in.	2 7/16 in.
Second	13/16	2 3/8
Third	13/16	2 5/16
Fourth	13/16	2 1/4
Rear	1 9/16	2 3/16

Diameters of these bearings increase from rear to front, thus permitting withdrawal of the camshaft endwise. Valves are operated by mushroom cam followers. The valve alley is made readily accessible by removal of two cover plates. Alloy steel valves are used, the lifts being 5/16 in. and the clear diameters 1½ and 1⅜ in. for the inlet and exhaust respectively.

Adjustment of the Timing Chain

Adjustment of the timing chain is accomplished by swinging the generator. This operation is facilitated by means of an inspection hole in the timing case cover through which the tension can be gaged. The generator is driven through a flexible coupling made up of a number of laminations of spring steel and is so mounted that it can be removed without disturbing the timing chain.

The distributor is mounted on the generator and is driven off the rear end of its shaft through helical gears, the thrust being taken by a button and spring housed in the timing gear cover. Cables leading to the spark plugs are protected by conduits.

Oil is supplied under pressure to main, camshaft and connecting rod bearings by a gear oil pump located in the crankcase and driven from the camshaft by helical gears. Lubricant is conducted through tubing to each main bearing and thence through the drilled crankshaft to the pins. Camshaft bearings are supplied with oil from the main bearings by ducts drilled in the crankcase webs. Generator sprocket bearing and timing chain also are lubricated positively.

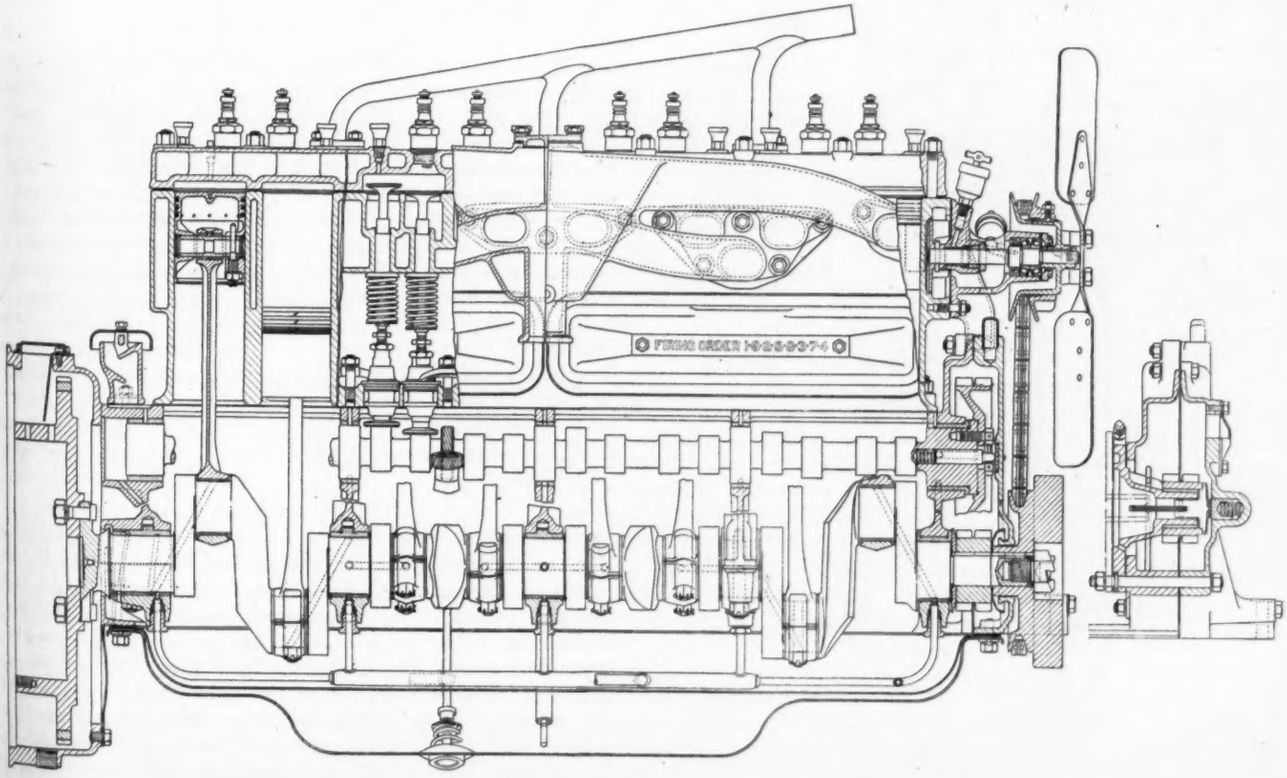
Crankcase Has Convenient Drain

Crankcase drainage is provided for in a novel manner. The drain valve is of the poppet type and is held against its seat by a spring. It is operated from above by a pushrod. Oil level in the crankcase is measured by a bayonet gage.

Cooling water is circulated by a centrifugal pump housed in the front end of the cylinder block casting. The pump rotor shaft, which also carries the fan, is supported by a bracket bolted to the block. At the pump end the shaft is supported in a bronze bushing and at the fan end by two opposed roller bearings. Grease cups are provided for lubrication of these bearings.

A four-bladed fan of 17½ in. diameter is driven from a pulley which is integral with the vibration dampener. The front flange of the fan pulley is threaded on and held by a setscrew. Adjustment of the tension of the V-link fan belt is secured by moving this flange in or out. The radiator is a cellular type and the capacity of the cooling system is 5 gal.

Fuel is fed from an 18-gal. tank at the rear of the chassis to the 1¼-in. Model OX-2 Stromberg carbureter by means of a vacuum system. A United centrifugal air cleaner is regular equipment. The inlet manifold is 1½ in. in diameter and is of the ramshorn design. The quantity of heat supplied to the mixture can be adjusted by means of a control valve bolted to the top of the manifold casting. To change the adjustment it is necessary simply to remove the nuts, turn the control valve through 90 deg. and replace it.



Longitudinal view of the Jordan "Line Eight" engine manufactured by Continental

A two-unit, single wire, six-volt American Bosch electrical system is used. The starting motor drive is through a 2 to 1 gear reduction and Bendix pinion which meshes with teeth cut in the periphery of the flywheel. The generator is a third brush type and is protected against open circuit by a fuse in the field circuit. A push and pull type ignition switch is located in the center of the instrument board. The lighting switch is mounted in a convenient position on the steering column directly underneath the wheel. The Willard threaded rubber storage battery is located under the left front seat. A stoplight is regular equipment on all models.

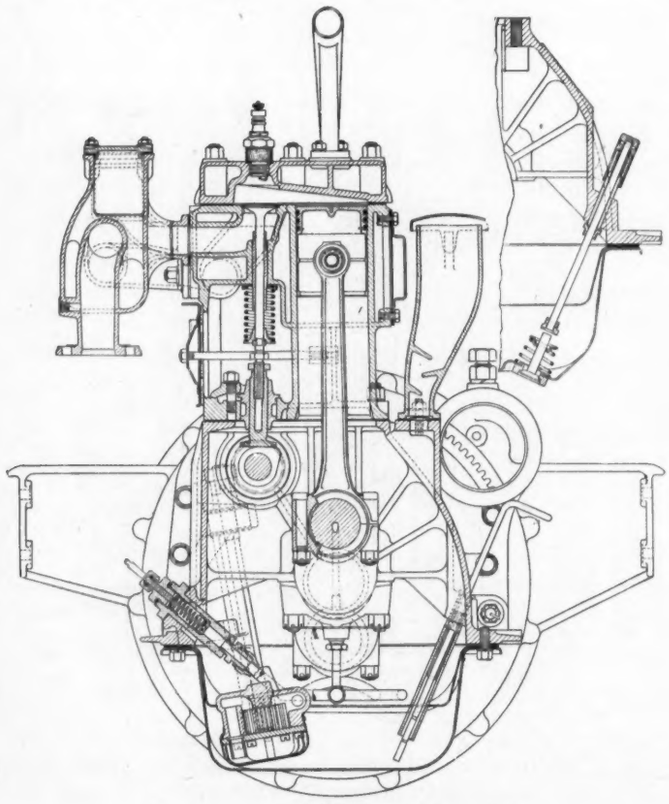
Clutch and gearset are mounted with the engine and both are products of the Detroit Gear & Machine Co. The former is a dry plate type and the latter provides three speeds forward and reverse in the following ratios:

Low	3.12 to 1	High	1 to 1
Second	1.69 to 1	Reverse	3.78 to 1

Details of Transmission

The mainshaft of the gearset is carried in annular ball bearings, while Hyatt rollers are used on the countershaft and for the clutch pilot. The propeller shaft is a 1¾-in. steel tube with oil-tight, metal universals at each end. Rear axle torque and propulsion are taken through the springs. The rear axle is a semi-floating Timken with helical bevel gears and a four-pinion differential. The pinion shaft is carried in three bearings and there are two bearings at each wheel. On the open models the reduction is 4 5/11 to 1 and on the closed models 4 7/11 to 1. Springs are semi-elliptics, 2 in. wide, those in front being 37 in. long and those in the rear 55¾ in. The front axle is also a Timken.

A worm and sector type Gemmer steering gear provides an 11½ to 1 reduction. Pivot bearings are phosphor bronze bushings and thrust is taken by ball bearings. The steering wheel has a walnut spider and is 17 in. in diameter. The minimum turning radius is 20 ft. to the right and 22 ft. to the left.



Transverse section of Jordan eight

Hydraulically operated four-wheel external service brakes of the same type used on the six are regular equipment on the new car. The brake drums are 14⅜ in. in diameter and 2 in. wide. The hand brakes are contracting type acting on a drum at the rear of the gearset.

A Parish & Bingham frame with channel section side rails having a maximum depth of 7 in. and a thickness of 5/32 in. is employed. There are three gusseted crossmembers and three tubular, torsion-resisting members. One of the latter is located at the center of the frame and the other two at the ends. Wheels are wood, artillery type, with 12 spokes, and the rims are Firestone straight side detachable. Balloon tires are regular equipment on all models. Chassis lubrication is by the Alemite system.

Fenders are of the double beaded crown type and the front spring and frame ends are covered by a black enamel splash plate. The radiator shell, head lamps, motometer and hood center hinge are nickel plated. A new design of radiator shell has the center top line slightly raised. All models have automatic windshield cleaners, Waltham clocks and speedometers, rear vision mirrors, cowl ventilators, and combination stop and tail lights. The instruments are grouped in two panels under glass, the speedometer and clock being in the right and the oil and gasoline gages and ammeter in the left panel.

Option of Two Colors

Two optional colors, dark blue and Crane Simplex gray, are offered, and in the closed models a color option also is offered on the upholstery. The brougham and Victoria are equipped with touring trunks containing two suitcases, and the new "Playboy" body has a comfortable rumble seat in the rear deck and a removable rear panel in the top. The closed bodies have Brewster type windshields, and Crane-Simplex or pyroxylin finish is used on all Line Eight models.

A BILL has been introduced by the French Government with a view to bringing the French patent procedure into line with the practices of other countries. At the present time the French Patent Office makes no preliminary examination and makes no objections to claims, and it labels every patent s. g. d. g. (without guarantee of the Government). The result is that French patents are of very questionable value until they are upheld in court. It is true that the courts have been rather favorable to the inventor and usually make infringement of valid patents rather expensive to the infringers. One feature of the bill referred to is that it extends the term of a patent from 15 to 20 years and another that when a patent has been worked for five years without attack it may be sustained even though an anticipation is found, provided this remained unknown to the patentee up to that time.

A CHANGE has been made in the organization of aeronautic research in England. Heretofore the Director of Research has been responsible for both scientific research bearing on aeronautical matters and for work pertaining to technical developments of aircraft, engines and accessories. In April next this office will be abolished and control of one branch of the work will be transferred to a Director of Scientific Research while that of the other branch will be assigned to a Director of Technical Development. Both of the new directors will serve under the Air Member for Supply and Research.

Just Among Ourselves

"How About a Little Service on This Car, Stranger?"

A SMALL town banker from the southwest is said to have stopped the other day at the factory service station of the company which built the car he owned. He told the service man who approached him something like this: "Here I have had this car only two years and have driven it only 27,000 miles. Since I got the car you have changed the transmission design. I want one of the new transmissions installed in my car free. Moreover my engine needs to be overhauled and I think you ought to do it for me." Maybe that isn't just what he said nor the way he said it, but that's what his ideas amounted to. He was passed on to the service manager and finally to the vice-president of the company, courteous and careful explanations being made by each factory man as to why it wasn't quite fair of him to ask what he did under the circumstances. We don't know exactly how the incident ended—probably he got some free service after all—but he didn't get the transmission. Educating some parts of the public seems likely to be *some job*.

Headlamps Design Undergoing Changes

WHILE headlamps have not occupied the forefront of publicity in the past few months, they are receiving a lot of thought in several different automobile plants. Dimmers are generally condemned, as the driver's eyes do not adjust themselves to the sudden changes in the intensity of illumination and consequently produce a condition which is comparable to no road illumination. Just now the adjustable reflector by which the bright lights can be tilted down upon the approach of another car is occupying the thoughts of many designers and it may be predicted that several more lines of cars will be fitted with this type of device.

Pirate Part, Automotive Freebooter, Gets Attention

IF a term is used long enough in a rather loose way someone eventually bobs up and asks the disconcerting question, "Just what do you mean by that term?" Pirate Part has been a well known character in the automotive drama for a good many years, and a lot of people have been ready and willing to say just who he is and just where he lives. But few people agree either as to his identity or his habitat. Some close observers have been asking for a better identification of this interesting character, but have been only partly successful in their search for knowledge. The latest official inquiry on the subject has been started in San Francisco, where the Better Business Bureau of the advertising club has instituted a campaign to eliminate the term "pirate parts" in advertisements and news items issued by automobile dealers and manufacturers. The claim is that indiscriminate use of the term casts aspersions on the wares of many manufacturers and merchants who are entitled to "a place in the sun." It's always in the interests of good business for advertising to say just what it means.

Public Sells 'Em and Dealers Buy 'Em

"WE want to take in 100 used cars during our first week in business," advertises a Cleveland dealer. Several others in the same town have large signs plastered on their windows telling the world of their intense desire to get hold of some used cars. Judging from the number of old models stowed away in various dealer establishments throughout the country these gentlemen shouldn't have much trouble getting their hundred—or ten times that many. Difficulty is that is the kind of used car they want. The psychology of this advertising certainly looks as though some dealers were going into the purchasing business with a vengeance. More selling and less buying would help to put pep in retail sales.

Says Mr. Dealer to Mr. Car Builder, "It Seems to me—"

CLICK! Click! Click! Click! The typewriters of the dealers' associations are busy turning out diplomatic documents for the perusal and edification of the members of the National Automobile Chamber of Commerce individually and collectively. From Detroit, Chicago, Grand Rapids and points west communications have been sent to the manufacturers urging the elimination of the practice of overloading dealers with cars and suggesting various remedies for the merchandising troubles which have beset the retailers with increased vigor in recent months. Some of the suggestions about analyzing dealers' financial statements, supervising their capacity to handle cars, studying carefully market possibilities before carrying out manufacturing schedules are good ones and already have been incorporated into the practice of a good many manufacturers. It is one thing to install a policy and another to work it out effectively in practice. Many car builders have been trying sincerely to improve merchandising methods. The ideas incorporated in the letters from dealer associations should be of very practical help in achieving the desired improvements. It begins to look as though everybody in the industry were going to express himself even more freely and frankly in the future than in the past.

N. G. S.

Wide Range of Specialized Work Now Performed by Milling Machines

Standard machines with special heads do great variety of work at small additional expense, and place this type of tool in the semi-automatic class.

By W. L. Carver

DEVELOPMENT of the details of design of the milling machine itself and the attendant fixtures have lifted the former out of the class of ordinary machine tools and placed it in the semi-automatic or automatic classification. No longer does the picture of an apprentice boy nodding over the table of an easy-going milling machine hold good in production shop practice. With the improvements which have been perfected at a comparatively recent date, milling machines have taken on the true characteristics of the cyclic type of machine.

The operator is occupied chiefly in loading and unloading pieces while the balance of the cycle is handled automatically by the machine. In the most improved combinations of the correct machine and carefully designed fixtures, loading and cutting time requirements are balanced to produce maximum output per man-hour, in many cases being arranged so that one man operates two or three machines.

These characteristics are obtained at no expense to the flexibility or range of adaptation of the machine, although in some cases special heads are mounted on standard machines. The machine itself, however, retains all of its general manufacturing characteristics and can be adapted to an entirely different specialized operation with but very little additional expense. Due to the requirements of production economy and the reduction of unit costs, this is a legitimate expense which can be amortized at a slight fraction of the cost of replacement by a new specialized machine.

In addition to these accounting or financial advantages, the increased ability of the milling machine, due to its automatic or cyclic operation, has expanded its field of application so that a wide range of production operations can be handled now at reduced costs. This variety of operations is demonstrated by the following illustrations, which are typical of recent installations made by the Cincinnati Milling Machine Co.

Fig. 1 illustrates a standard No. 4 milling machine equipped with a special head carrying three cutters which are arranged to mill three surfaces of a gear box as shown. The machine is absolutely standard, the special head being bolted to the over-arm and column and driven from the regular spindle. Two fixtures are mounted on the table. In each fixture a gearbox is piloted at the base by the bell housing flange and registered by dowels in the bolt holes, clamp screws being provided as shown.

In operation, one casting is loaded while the other is being machined. The cut at each end is from the center outward and as the cut is completed stops on the table engage the quick return mechanism which traverses the table rapidly to the opposite end. The rapid motion is again stopped just before the cutters engage with the work and the regular cutting feed is engaged until the cycle is completed. In this set-up the table oscillates automatically with very rapid action following each cut. The operator is occupied in loading and unloading only. Forty cast iron gearboxes per hour are put through this operation.

Fig. 1—Three-spindle special head for finishing milled surfaces on gear boxes

Another special head is illustrated by Fig. 2. It is mounted in this case on a standard No. 5 horizontal milling machine. Three vertical spindles are incorporated in the head, which is bolted to the column, over-arm and outboard support. As shown, one cutter finishes off the bolt bosses on the top of the cylinder head, while two other cutters rough and finish the gasket surface. At the end of each cut, the table returns at high speed to the loading

position, where one casting is removed, the other is transferred and turned over and another casting is inserted. Both castings are clamped by means of two hand nuts adjacent to the operator.

Equalizing bars regulate the pressure on three clamps and intermediate equalizing blocks are located between the two castings. After loading, the operator engages the table feed lever, which advances the table rapidly to a point close to the work, when a supplementary stop brings the table down to cutting speed. One finished piece comes off of this machine every five minutes and production is kept in balance, as both sides of the casting are milled in the same set-up.

Produces Sixty Operations Per Hour

Sixty operations per hour are produced in the set-up shown in Fig. 3, in which the bearing ends of a four-bearing aluminum crankcase are finished. This plain automatic milling machine of the manufacturing type is one of the units of a conveyor type engine production line. Therefore the hand control is extended to the end of machine by means of a lever and link. This lever controls the entire cycle of the machine, which is as follows:

In the loading position, the fixture on the table is located near the right end. The crankcase casting is slid from the conveyor onto the ways of the fixture, tilted to the horizontal position and slid over the clamps and clamp levers against the vertical surface at the back of the fixture. Clamp bars and levers then are swung around into position and locked by a single motion. The control lever then is tripped and the fixture advances rapidly up to the cutters, where it is retarded to correct cutting speed and finally returns rapidly to the loading position and stops for the repetition of the cycle. A clear view of the stops involved is shown in the foreground.

An entirely different type of operation is illustrated by Fig. 4, which consists of 24 in. plain automatic machine equipped with a special head and tail stock for a saw arbor. This installation approximates a special automatic machine, as operation is continuous with the operator constantly engaged in removing and reloading at the left end of the machine.

Ten pairs of vertically aligned studs are located around the turret of the fixture. Over these, babbitt-lined bronze backed bearings are carried for the splitting operation. The lever at the upper left engages with spring actuated plungers which clamp the bushings at their outer ends through equalizing bars and bearing blocks. As the fixture in indexed during each outstroke of the table by a supplementary slide, the end of which is inclosed at the extreme left, four half-bearings are released by the actuation of the hand lever and then two new complete bushings are installed.

A rapid traverse feature also is utilized in this installation to draw the fixture away from the saws during the indexing period. After this portion of the cycle has occurred the table also is returned quickly to the point of actual cutting operation. At each pass of the table the saws pass between two adjacent pairs of bushings, separating them at one side while the preceding pair receive the final operation. At the end of each cut, the table is reversed at high speed entering the indexing period as soon as the clamps are clear of the saws. The unit time for the complete operation is 0.12 min. per piece, or a production of eight pieces per minute. Any subsequent change of design in the bushings can be accommodated by merely changing the studs in the fixture.

Steel Clutch Driven Hubs Processed

Forged steel clutch driven hubs are processed through the set-up shown in Fig. 5 at the rate of 1.1 min. per piece, the operation being the milling of both sides of six splines. Four cutters are carried on each of two arbors, one working below center and the other above. With the exception of bolted-on outer arbor supports, the machine is a standard 48-in. duplex milling machine.

Fig. 2—All milling operations on cylinder head are performed by a special head

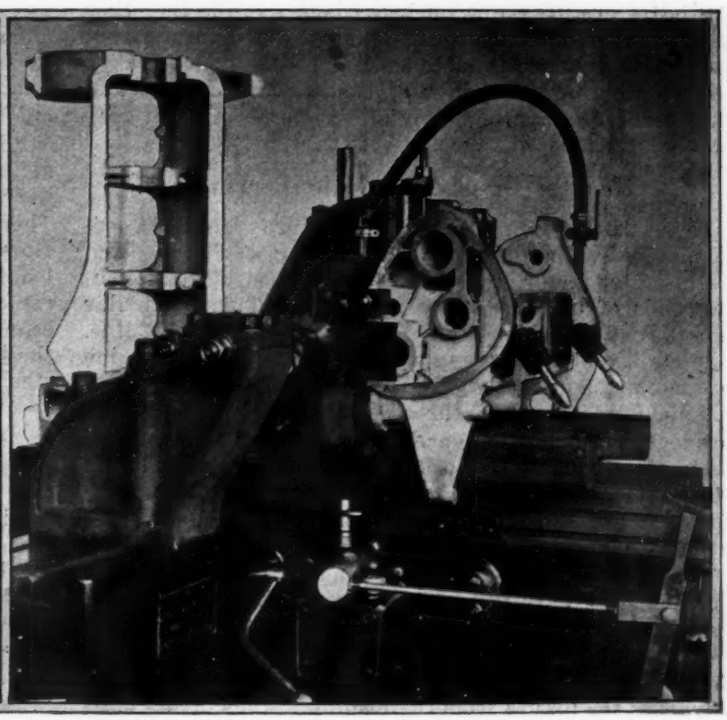


Fig. 3—Set-up for milling main bearing ends of sixty aluminum crankcases per hour

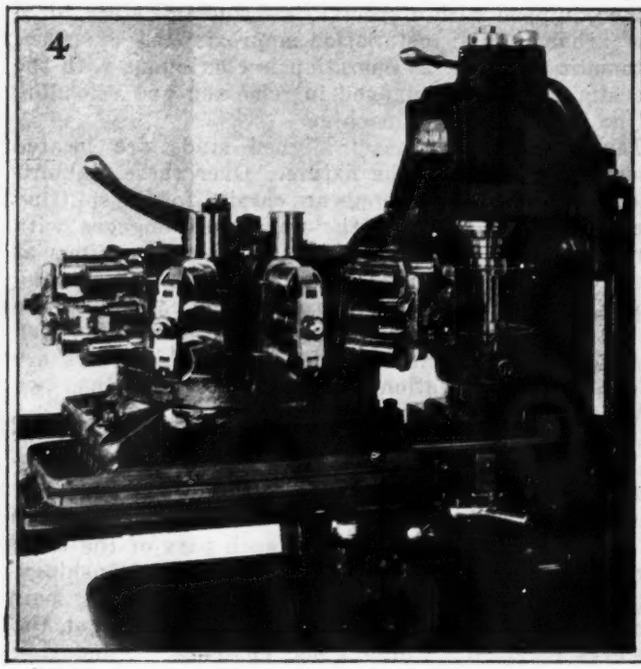


Fig. 4—Ten-station fixture and special head duplicate production of specialized automatic machine

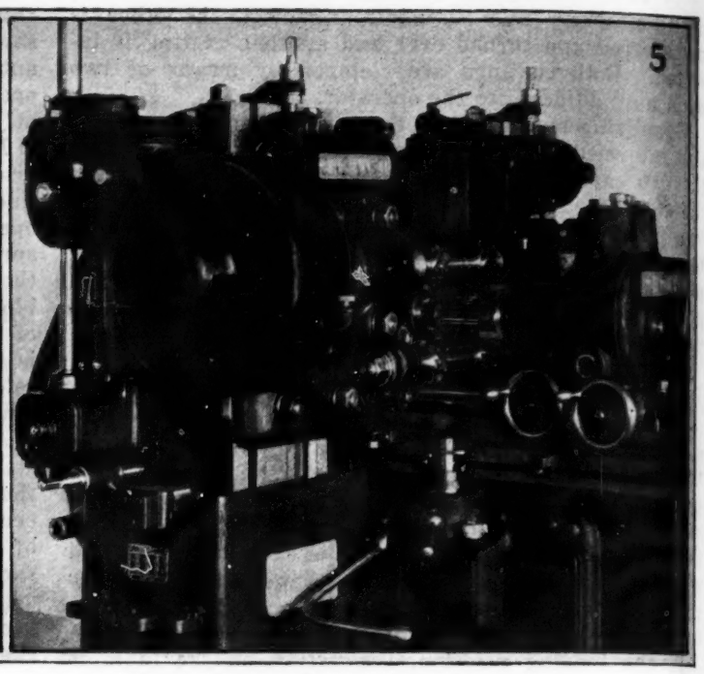


Fig. 5—Special fixture for milling splines on forged steel clutch hubs

A special head carrying two arbors is mounted on the table of the machine and is indexed automatically by the supplementary slide shown at the extreme right.

As two splines are milled at each pass of the tables, the head is indexed three times for six-spline work and the table is then stopped in the outer position for reloading. Although the clutch hubs are carried on special mandrels, one of which shows at the center, the work is clamped between the head and the tail stock by the formed heads which also are shown. Two hand wheels, shown in the foreground, control the tail stock centers.

Two hubs are loaded on each arbor and two sets of the latter are used, one set being loaded while the other is in operation. This work was performed formerly in automatic gear cutters, but the new method shows a considerable economy in unit time and labor cost and the machine is available for other operations that may result later from changes in design.

Handles Crankshaft Main Bearings

Crankshaft main bearings also are handled economically by the automatic type milling machines. Fig. 6 illustrates a multiple straddle milling set-up for finishing ends of three main bearing caps. This particular installation is designed for a three bearing engine line. Similar layouts have been made for four-bearing engine production, and in that case the fixture is arranged to handle four instead of three bearings, thereby carrying production along in balance. The bearings are mounted on hardened plates and located by means of dowels in the stud holes. Gooseneck clamps retain each of the bearings and are actuated by means of a single lever for the group of three at each end.

This single lever operation is made possible by the use of equalizing bars between the lever operated camshaft and the clamps. When the lever is released for unloading, retracting springs open the clamps. This set-up is featured also by the quick travel of the table which advances the fixture from the loading to the cutting position and also returns the table to the loading position after the cut is completed. The machine is a standard 48 in. plain automatic and the fixture is also standard.

Indexing of the fixture is performed by hand, the release lever being shown at the extreme right. Production on the job shown is approximately six pieces per min., the material being cast steel. A considerable range of redesign is allowed in this case as the length of the caps is determined by the spacing of the cutters and the dowel and mounting block assembly can be changed to suit any new spacing and size of stud.

Bolt bosses on bearings caps are finished in an unusual adaptation of a 24 in. duplex vertical machine which is equipped with special heads carrying vertical spindles as shown in Fig. 7. A standard hand indexed base is mounted at one end of the table, each end being fitted for two pairs of caps which are held in place and in line by means of dowels and bar clamps. The outer end is loaded while the inner end is fed under the cutters.

Rapid travel is utilized to bring the work up to the actual cutting position and stops are arranged to shift the table rapidly between successive cuts in each cycle. Therefore the table advances in four rapid and four slow stages and finally returns at the high rate to the loading position. It is stated that the ability to advance rapidly between cuts makes this set-up somewhat more economical than the rotary process. The unit time for the job shown in which the caps are made of drop forged steel, is 0.26 min.

Cuts Keyways in Rear Axle Shafts

Four keyways are cut in the ends of each of two rear axle shafts by the installation shown in Fig. 8 in which the heads carrying the shafts are indexed automatically. Due to the spacing and width of these keyways some trouble caused by interference was experienced when producing these parts in hobbing machines. As shown here, the shafts are secured by hand operated drawn-in collets and stopped against hardened steel plugs. The rapid table travel also is utilized in each cycle of this set-up. Heat treated alloy steel shafts are finished through the key-cutting operation at the rate of 1.8 min. per piece.

Fig. 6—Standard fixture and machine for bearing end milling. Note single lever clamp control
Fig. 7—Special heads and standard indexing fixture for milling bearing bosses
Fig. 8—Special automatically indexing fixture, milling unusual splines in rear axle ends

Fig. 9—Milling out universal joint members. Two pieces are clamped by one cam

Fig. 10—Form milling windshield brackets. Note balanced support pins which compensate for irregularities of castings

Fig. 9 illustrates a rotating table set-up used for universal joint flange and ball yokes both of which require the same width of slot. As in several other typical installations, a single clamping cam is utilized to clamp two pieces through the intervention of an equalizing bar. Production is balanced in this installation by adapting one end of the fixture to flange yokes and the opposite end to ball yokes. The production time per piece is 0.185 min. Selective stops are used to regulate the speed of the table for cutting and clearance purposes.

Malleable iron windshield brackets are form-milled in the standard hand-index fixture illustrated in Fig. 10, the machine being a standard 48 in. plain automatic. Two pieces are mounted in parallel at each end of the fixture,

being located by dowels in previously drilled holes and balanced pins which are locked by the handwheels at the sides of the fixture. The pair of brackets are retained by a single strap clamp having swivelled fork ends for each piece. One of the hand levers at the end of the fixture controls the indexing plunger while the other locks the upper portion of the fixture on the base. The time per piece for this operation is 0.675 min.

A résumé of the typical examples which have been discussed develops several interesting features. In every case the machine is basically a standard unit capable of being adapted or utilized for other operations at minor expense. By this, it is not meant that changes in set-up are to be made to accommodate several different types of operation during one production run as each of these installations is primarily a unit of a manufacturing line.

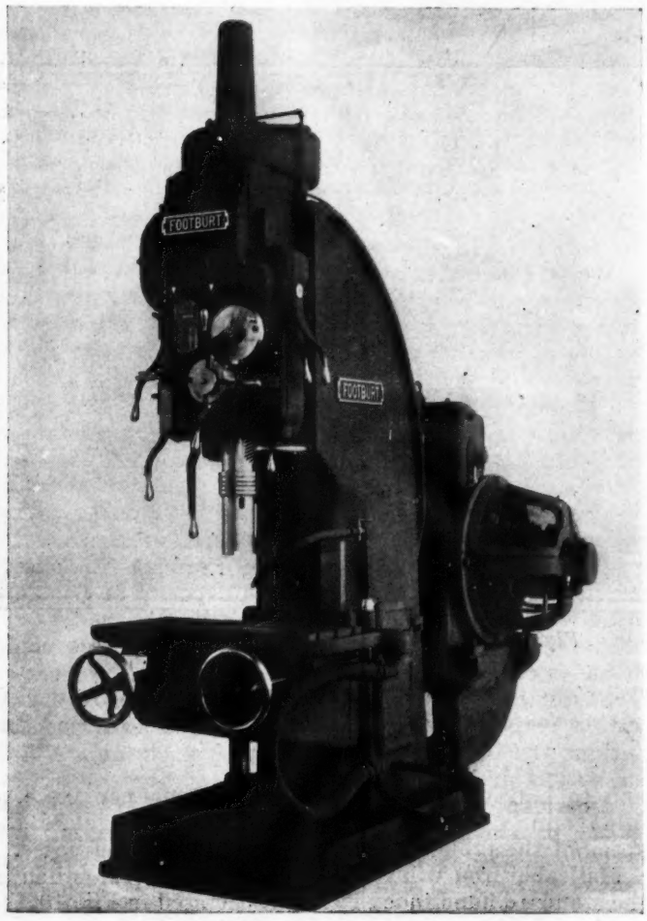
Study and development of special heads and fixtures, however, has made a standard machine capable of producing highly specialized results and at the same time utilizing a basic production or general manufacturing unit which can be modified at comparatively small expense to meet later changes of design and shop conditions. In many instances, where special fixtures have been developed at fairly large expense, these units can be adapted to changes of design in the same class at a relatively small outlay as in the case of the fixture for splitting bearing shells, Fig. 4.

Fixtures are characterized uniformly by their abundance of metal and adequate provisions such items as hardened bearing plates and clamps. Uniformity of production hinges on maintaining a solid base for the work and then insuring proper location by eliminating wear at the locating surfaces. Loading time which is rapidly becoming a determining factor in the selection of machines of the cyclic type is reduced by the use of single levers for the clamping of two or more pieces. This provision is made possible only by the use of intermediate equalizing facilities which insure equal distribution of the clamping pressure.

Although the machines are standard manufacturing units, the provisions for variable table speeds for cutting, idle gaps, clearance, advance and return reduce the floor to floor time per piece so that this factor combined with the careful provisions of fixture design make these machines perform the functions of highly specialized cyclic machines.

Drilling Machine Which Is Said to Have Broken World's Record

A HEAVY type high duty drilling machine designated the No. 25½ has been brought out by the Foote-Burt Co., Cleveland, Ohio, and was exhibited at the Atlantic City convention of the American Railway Association Mechanical Division in connection with the exhibit of a twist drill manufacturer, on which occasion the world's record for drilling speed is said to have been broken on it. In connection with automotive production the machine is said to be adapted for such work as drilling the holes for the knuckle pins of front axles.



Adapted for such work as drilling holes for knuckle pins in front axles

One of the outstanding features of the machine is said to be extreme rigidity, coupled with the fact that the head is bolted to the face of the upright, so that the bolts are in shear instead of in tension. This counteracts any tendency toward deflection of the point of the drill.

Owing to the fact that all of the mechanism of the machine is contained in the head proper, the head can be entirely detached from the upright. This construction permits of the use of a pump lubrication system and of the elimination of hand oiling.

Speed changes are obtained by means of a sliding gear mechanism similar to an automobile transmission. Nine changes of speed can be obtained by means of the speed change levers, and by transposing one set of pick-off gears a total of eighteen feed changes can be secured. Steel gears are used throughout.

Except for the sliding gears, which have stub teeth, the gears are of the helical type. The spindle bearing is of bronze and all other bearings are of the roller type.

This machine can be furnished for either belt or motor drive, though the machine with which the demonstration at Atlantic City was made had a 70 hp. motor. In this demonstration, we are informed, a 1¼ in. drill went through cast iron at the rate of 116 in. per minute and through machinery steel at the rate of 44.8 in. per minute. With a plain table the machine weights about 10,000 lb. and with a compound table 11,000 lb.

THE Bureau of Standards has developed an oxidation test for lubricating oils which is carried out as follows: A sample of the oil in a closed flask filled with oxygen is exposed to a temperature of 200 deg. Fahr. for 2½ hours. The precipitate thrown out by a definite solution of the oxidized sample in petroleum ether is determined. The mass of this precipitate, expressed as a percentage of the original sample (10 grams) is taken as the oxidation value.

Good Weather and Better Service Needed to Increase Swedish Sales

Merchandising prospects bright at present, although business was disappointing in early months of 1924. Money on gold basis. Sweden is only European country with undepreciated currency.

By Birger Jacobson

SHIPMENTS of automobiles to Sweden in the first half of 1924 did not reach anywhere near the expected number, though in 1923 that country was a very heavy buyer. This slowing up was not due to depreciated currency or increased import duties, but primarily to a winter which lingered months beyond its usual time and kept both roads and harbors ice bound.

The Oeresund, inlet to the Baltic Sea on the South remained frozen until late in April, a thing which has happened very few times in the last hundred years. When it does occur it foretells that summer, if it comes at all, will be very late.

Ordinarily the seasonal sale of automobiles begins in the southern part of the country in March, but this year the heavy snow and ice covered the roads until May and in some places until June. Naturally the dealers could do very little to move their stocks of cars on hand.

Too, there was some discussion in the Riksdag during the spring months concerning an increase of the present import duty, 15 per cent c.i.f. port value of the car. This bill was finally defeated, but another imposing a gasoline tax to be used for road improvements was passed and went into effect on June 1 of this year.

Uncertainties surrounding the import duties, coupled with the move which resulted in Sweden putting its currency on a gold basis just at the time when dealers usually place their orders, resulted in considerable hesitation in business.

Sweden with its steep hills and long stretches of roads which are often bad favors the American made, light weight car with its comparatively big motor and comfortable arrangements for the driver. While a great many cars of European make were shown at the Gothenburg Exhibition last summer no considerable increase in their sales resulted. Only one, an Italian made car, is sold widely.

Competition Has Increased

Competition is keen in Sweden since two well known American manufacturers of low priced cars have established local assembly plants and appointed direct dealers in every little city and community in the country. Distributing houses representing other well known manufacturers have had to put forth more sales effort and have reduced their retail prices and profits. Too, the people of the country have come to expect and demand service, and unless the dealer can convince his sub-dealers that he will at all times maintain proper service for all models on short notice from stock within the country, he will find it all but impossible to sign them up.

Service demands considerable capital, for not only do dealers have to pay for cars months in advance of arrival, but they have to pay for all the accessories and parts they carry on the same basis. There is only a handful of distributors who can do this. Besides this practice means a speculation for the individuals or companies representing factories which sometimes make radical changes from year to year.

In Sweden there is no used car market. An owner repairs and repaints his old car from year to year rather than turn it in on a new one. Insurance companies, which work and quote their premiums very differently than is done in this country, maintain the same premium from five to ten years.

Sweden Has No Finance Companies

Though Swedish banks have never lost money on American cars, they do not generally finance automobile imports and they carry time payment contracts only on the strength of the dealer himself. Finance companies as we know them do not exist, but some of the dealers have been able to start them out of their own capital. If at the end of this present season these organizations have proved successful it is certain that automobile finance companies will be established.

The time payment contract in use is a very simple one. The buyer signs a paper in which he agrees to rent the car until the draft or drafts have been paid in total.

While Sweden is a small country with only a population of six million, it is the only country in Europe whose currency is worth its normal and nominal value. It is a country of natural wealth with honest, energetic people.

Before the war, Northern Russia was governed to a considerable extent by the recommendation of Sweden and when Russian business opens up, which is anticipated in the near future, American manufacturers whose dealers have maintained service will find an open market.

Sweden still is buying a considerable number of a well known, low-priced, 1-ton truck chassis. The market for trucks of from 1½ to 2½-ton capacity is gradually opening up. The Scama-Vabis and Tidaholm, Swedish manufacturers of this latter type, have become established successes.

Three ton and heavier trucks are not salable to any extent because of war stocks still in use, bad road conditions and the imposition of additional tax on the basis of weight.

American manufacturers of buses of twenty and thirty passenger capacity will be able to make sales if they go after their prospective customers in the right way. Chassis have a better sale than the complete buses chiefly because Swedish body builders can manufacture bus bodies which meet requirements in detail for less than they can be built and shipped there.

"Sealed Order Week" Combines Dealer Education with Sales Appeal

Oakland stimulates fall sales by a novel merchandising campaign which shows retailers how to demonstrate cars. Special day to be devoted to each important feature.

By D. M. McDonald

CARRYING the mysterious just a step farther than has customarily been the case in the introduction of a sales campaign, Oakland Motor Car Co. this year has introduced "Sealed Order Week" as a means not only of exciting the greatest possible public interest in its models, but of stimulating its distributing organization to the highest possible point of efficiency in demonstrating the features offered in its cars.

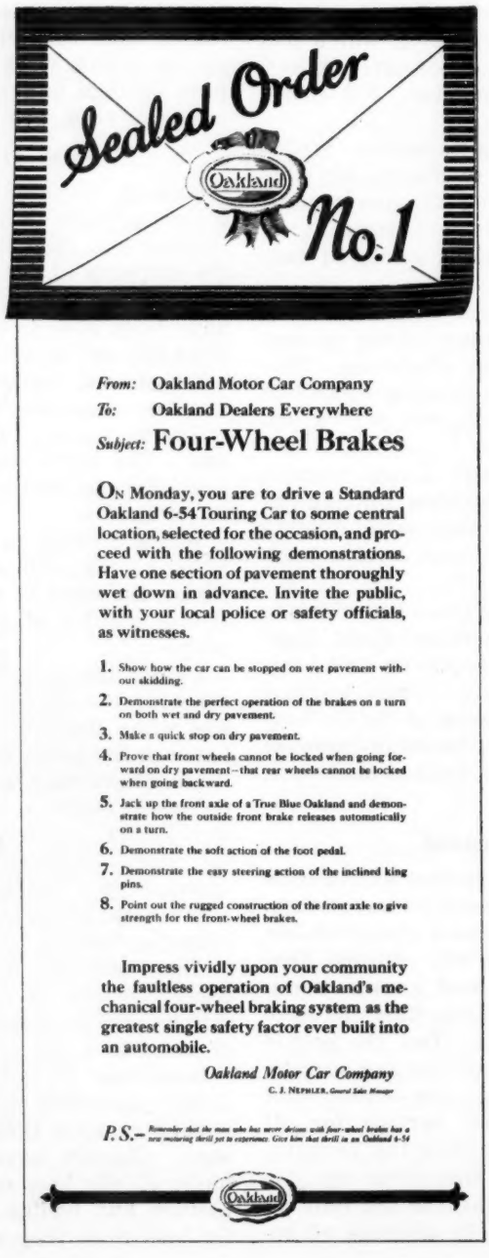
The term "Sealed Order Week" was borrowed from the phraseology of the sea. Sailing under sealed orders, the skipper and his crew provisioned for a voyage, but didn't "point her nose" until they broke the seals after passing from sight of land. Perhaps they were to fight the Berber. Possibly to hunt the tree-climbing fish. The element of mystery made the thrill and everyone was ready for anything when the orders were brought forth.

As adopted by Oakland, the dealer and his salesmen are the captain and his crew in "Sealed Order Week." Cars are the provisions, and the port is the great American motor vehicle buying public. The sealed orders tell how best to reach the owner with the message of Oakland quality and performance.

Though essentially a campaign of instruction in demonstrating the Oakland car, public interest is aroused through a preliminary teaser campaign and through the posting of the various tests which the car would undertake from day to day.

Owing to the fact that Oakland is not introducing a new model, it was necessary to devise some unusual means of getting attention.

Each day the dealer, in the presence of his force and as many of the public as can be brought to the salesroom, breaks a seal and learns what feature of the car is to be dwelt upon that day. This is done in a public demonstraiton at the salesroom or at some prominent point in the city, and privately with such patrons as seek demonstrations. The public is brought to the salesroom through special window displays and through newspaper advertising.


Sealed Order
Oakland
No. 1
From: Oakland Motor Car Company
To: Oakland Dealers Everywhere
Subject: Four-Wheel Brakes
On Monday, you are to drive a Standard Oakland 6-54 Touring Car to some central location, selected for the occasion, and proceed with the following demonstrations. Have one section of pavement thoroughly wet down in advance. Invite the public, with your local police or safety officials, as witnesses.
1. Show how the car can be stopped on wet pavement without skidding.
2. Demonstrate the perfect operation of the brakes on a turn on both wet and dry pavement.
3. Make a quick stop on dry pavement.
4. Prove that front wheels cannot be locked when going forward on dry pavement—that rear wheels cannot be locked when going backward.
5. Jack up the front axle of a True Blue Oakland and demonstrate how the outside front brake releases automatically on a turn.
6. Demonstrate the soft action of the foot pedal.
7. Demonstrate the easy steering action of the inclined king pins.
8. Point out the rugged construction of the front axle to give strength for the front-wheel brakes.
Impress vividly upon your community the faultless operation of Oakland's mechanical four-wheel braking system as the greatest single safety factor ever built into an automobile.
Oakland Motor Car Company
C. J. Nephler, General Sales Manager
P. S.— Remember that the man who has never driven with four-wheel brakes has a new motoring thrill yet to experience. Give him that thrill in an Oakland 6-54
Oakland

The campaign was mapped out by the company and the Campbell-Ewald Co., advertising counsel. Each dealer has received a full set of instructions, together with the special cards, large sealed envelopes for window display, and advertising and publicity matter for the newspapers. The sealed envelopes are to be broken according to numerical rotation, preferably by a prominent citizen or official of the city, and then left hanging in the window.

Sealed Order Week, as a general rule, is being held either the third or fourth week in August in every city in the country, according to the ability of the dealer to prepare for it. Instructions were to run the teaser campaign several days preceding the breaking of the first seal, weekly papers in smaller cities to carry it a week ahead. Following the teasers was to come an announcement telling why the week is being held and inviting the public to the salesroom.

Follow-up ads are to appear during the week, telling of the demonstrations and urging people to look for what is going to happen the next day. The window display is to support the newspaper campaign, and in cities without daily newspapers, to sustain the interest in the next best way. Only dealers approving the local newspaper advertising schedules have the benefit of this part of the campaign.

Dealers are being urged to get a person of local prominence to open each sealed order and to announce in advance the person who is to officiate. This has been urged specially for the occasion of opening the first envelope as a

means of getting the week started with the largest crowd possible. A person in a different line of business for each day is recommended in the instructions.

The days of the week to be revealed by the sealed orders are designated as follows:

Monday—Four-wheel brake day.
Tuesday—Operation and control day.
Wednesday—Duco finish day.
Thursday—Safety day.
Friday—Advanced feature day.
Saturday—All-round performance day.

Suggestions as to demonstrations on each of the days are contained in the instructions as well as being specifically set forth in the sealed order. Each order is signed by C. J. Nephler, general sales manager of the company. Four-wheel brake efficiency is to be demonstrated at some prominent location in the city with police and safety officials as witnesses by special invitation. Operation and control demonstration is through attendance at the salesroom and in private demonstration of the car in operation.

Duco finish demonstration is to be in a public place. Tests of abuse through exposure to heat, chemicals, mud, etc., are to be given to prove durability under operating conditions. Safety features are to be established publicly by tests in various emergencies. Advanced features of the car are to be detailed through salesroom attendance. All-round performance is featured in a drive-it-yourself day, in which owners generally are to be invited to put the car through various suggested tests.

Dealers were urged to use extreme care in preparing for the week that they might cash in on it fully. Renovating and special decoration of salesrooms were suggested. An outline of the contents of each sealed order was given, so that everyone could rehearse for each day's activity.

Careful preparation of selling talks to go with each demonstration were included with the general orders preceding the program for the day. Getting the names and addresses of persons showing an active interest in the demonstrations or the doings of the week was urged as an important part of each person's duty.

Dealers were urged to use their ingenuity in inventing stunts which would help to call attention to the demonstrations, these, of course, to fit in with the definite orders of the week. "Do something new every day," they have been urged. "You've got to get people talking," said the factory, "before they'll come to your showroom to see what you are going to do."

Engineering Foundation Makes Its Annual Report

A COPY has been received of the Engineering Foundation's Annual Report for the year which ended Feb. 14, 1924. The Engineering Foundation is an organization established in 1914 by the American Societies of Civil, Mining, Mechanical and Electrical Engineers "for the furtherance of research in science and engineering or for the advancement in any other manner of the profession of engineering and the good of mankind." The idea originated with Ambrose Swasey of Cleveland, Ohio, who also made the first gift for endowment.

In the Annual Report is given a review of the activities of the Foundation during the past year. Among the research projects for which appropriations were made by the Council or in which it cooperated in other ways, the following are of automotive interest: Bearing Metals (for machines, etc.); Lubrication (of machines, etc.); Highway Research; Fatigue of Metals; Welding; Wood Finishing.

Researches on bearing metals are being carried on by a committee of the American Society of Mechanical Engineers. This committee has been inactive during the past year, but further investigations are being planned and efforts made to obtain additional funds. Christopher H. Bierbaum, Buffalo, N. Y., is chairman.

The Committee on Lubrication of the A. S. M. E. is continuing its work on the improvement of the lubrication of machinery, which has been carried on for some years. Albert Kingsbury of Philadelphia is chairman.

Engineering Foundation is represented on the Highway Research Advisory Board, Director Alfred D. Flinn of the Foundation being vice-chairman of the Board. The Foundation decided to make no financial contribution after 1923. This Board is said to be doing useful service under the auspices of the Division of Engineering, and reports concerning its activities are published by the National Research Council. Prof. Arthur N. Johnson, University of Maryland, College Park, Md., is chairman, and Dr. William K. Hatt, Purdue University, Lafayette, Ind., director.

The Fatigue of Metals Research has entered its fifth year. Engineering Foundation has continued to be treasurer of this project and has been represented on the Advisory Committee by its director. The third report on this research is incorporated in the Annual Report of the Foundation.

American Bureau of Welding was created by the Division of Engineering and the American Welding Society to provide impartial auspices for the scientific study of problems related to welding. Dr. D. S. Jacobus is the representative of the Foundation on the Bureau.

The study of wood finishing has been carried forward at the Forest Products Laboratory, Madison, Wis., and also at the Bureau of Standards, Washington. The Foundation's part in this work has been in the nature of promotion and education, principally through the activities of a small special committee. There are numerous cooperators in this research.

As regards the financial resources of the Foundation, the Report states that a balance of $34,668.23 was carried forward into 1924 and this, together with the income expected from the present endowment, gives a total income balance for the current year of $62,668.23. It is planned to spend during the year $16,350 on research projects, $9,200 for promotion of research and $4,500 for administrative expenses.

ONE of the most complete specimens of job analysis that has come to our attention is the "Minimum Specifications for Highway Engineering Positions," just published by the National Research Council of the National Academy of Sciences. This 105-page booklet gives in detail the qualities required for seventeen different positions connected with highway engineering and includes an occupational study sheet designed to develop briefly the qualifications of any individual job seeker.

The study is of interest not only because of the specific information contained regarding highway engineering work, but also as an example of job analysis. From this latter viewpoint it will furnish many useful ideas.

Four-Wheel Brakes and Low Pressure Tires Prove Worth in Grand Prix

Fourteen-mile course requires at least twenty gear changes per lap and is in no way a test of speed. Superchargers admitted to give considerably more power.

By W. F. Bradley

SOME indication of the nature of the 14-mile Grand Prix course can be gained from the fact that at least twenty gear changes per lap were required and less than five miles of the fourteen were covered on direct drive. On one stretch of switchback road the cars attained a speed of at least 130 m.p.h., and yet the record lap, established by Segrave on a six-cylinder Sunbeam, was only 76 m.p.h. It was impossible to time the competitors over the measured kilometer to get an idea of their speed ability, for either the course was winding and the cars were on a low gear, or the road was a switchback and the running was not normal.

No race held in Europe has been so keenly disputed, the competitors being of such a caliber that it was impossible to forecast a winner. Segrave in a Sunbeam set the pace for a couple of laps, when plug troubles held him back. Bordino's Fiat then went into the lead, and although hard pressed by Ascari's Alfa-Romeo, led the pack uninterruptedly for 130 miles. Brake troubles held Bordino back for 40 minutes and practically put him out of the running. Ascari then went into the lead, and with the exception of two brief intervals led for more than 300 miles. With only 14 miles to go, Ascari stopped for a change of plugs, but his engine had seized and he could not start away again.

The Delage drivers, realizing that they were inferior in maximum speed to the others, played a waiting game, and when Ascari's Alfa-Romeo showed signs of weakness Divo and Benoist went out in chase. It was then too late, however, and Divo finished 75 seconds behind the winner.

Indirect Victory for Fiat

The result of the race may be considered an indirect victory for Fiat. The winning car, built entirely in the Milan factory of the Alfa-Romeo Company, was a very close copy of last year's straight eight Fiat, its design having been entrusted to Engineer Jano, who, until a year ago, was one of the most important members of the Fiat technical staff. Alfa-Romeo and Fiat were extremely closely matched, as was shown by the 100-mile duel between Bordino and Ascari, men of equal value from a driving standpoint. Bordino, who admitted that he had nothing in reserve, could not shake the Alfa-Romeo off, but Ascari was also incapable of closing up on his rival.

The Alfa-Romeos went through without lifting their hoods, and no mechanical trouble developed until Ascari stopped with his engine completely seized. Fiat, for the first time in an international contest, lost all four cars, this being partially due to incomplete preparation. Bordino was put out when the brake control chain at the bottom of the right-hand steering pivot snapped off under braking stresses. He replaced this, but again broke it and narrowly escaped with his life. Nazzaro had plug troubles, and also, it was reported, fractures around the valve seats in the steel cylinders, which allowed water to pass into the cylinders. It was obvious that he had lost power soon after the start of the race.

Of the three Sunbeam cars, which had a certain resemblance to the Fiats, having been designed by Engineer Coatalen with the assistance of Engineer Bertarione, formerly with the Fiat Company, the troubles lay with a broken universal joint on Guinnesse's car, defective valves and plugs on the two others, and minor trouble with the brake gear. An indication of the severity of the contest is found in the fact that Segrave had to change his mechanician before half distance and Benoist had to do likewise.

Turbo-Compressor Supercharger on Sunbeams

The Sunbeams were fitted with a supercharger, which takes the form of a turbo-compressor driven off the front end of the crankshaft. No information was available as to the pressure generated by this blower at various speeds, but by its help the brake horsepower of the engine was said to exceed 160; not only was the power increased at high rates of revolution, but the effect of the charger was said to be even more conspicuous at low speeds, so affording considerable improvement in acceleration.

The only Miller in the race was an entirely private entry for which Count Zborowski was responsible. It ran for 112 miles, its best position being twelfth, and was finally put out by broken spring clips on the left-hand side of the front axle. Zborowski has added a fourth gear in order to make the car more suitable for this hilly course, and he had also equipped it with a second scavenger pump, driven by a small air propeller in front of the radiator. In the original design the feed and the scavenger pumps were the same size, with the result that after long running oil accumulated in the base chamber.

Delage raced with V-type twelve-cylinder engines which had been designed to use a supercharger. Owing to lack of time the supercharger was not fitted, and as the power was known to be much lower than that of the others, and the cars did not have the same maximum speed, they were hardly looked upon to furnish the winners. Their tactics appeared to be to let the faster cars fight it out and then to spurt in at the end. No mechanical trouble of any kind developed, and had the race been a little longer Delage might have got into first place. He was the only one to finish with a complete team.

Bugatti never really tested his cars, for on the first lap it was realized that the Dunlop straight side tires were quite unsuitable for these road conditions. The tires, which, it is declared, had been built to Bugatti's own specifications, had a perfectly flat heavy rubber tread, which completely frittered away when high speed was indulged in. The drivers realized that it was no use pushing, and most of them kept engine revolutions down to 4500, whereas they could have run at 5500, but even at this reduced speed tire life was short. The flat spoke cast aluminum alloy wheels, which Bugatti declares weighs 4 lb. less than a wire racing wheel, gave every satisfaction.

This race proved the value of the supercharger, which device was used by Alfa-Romeo, Fiat and Sunbeam. Since last year the Fiat engineers have added an air cooler to their appliance, this being carried between the front dumb irons, and assures the air reaching the carbureter at a very much lower temperature than on last year's models. Engineer Cavalli, who was responsible for the racing machines, declared that this feature is patented and that they have found important advantages from its use.

Alfa-Romeo's Supercharger Like Fiat's

Practically the same type of supercharging device was used on the Alfa-Romeos as on last year's Fiats, with the difference that a Memini carbureter was employed. Sunbeam was the only one having the carbureter before the blower. On these cars the blower is mounted on the front end of the crankshaft and a single Solex carbureter is used, its mounting being on the front right-hand side. The blower sucks through the carbureter and delivers through a horizontal pipe having a safety valve to take care of blow-backs into a normal intake manifold.

Only one Schmid cuff valve engine started in the race, and Goux, the driver, was held back on the first lap with a seized brake and went out after rather more than half distance with a leaky radiator. The cuff valve mechanism gave no trouble.

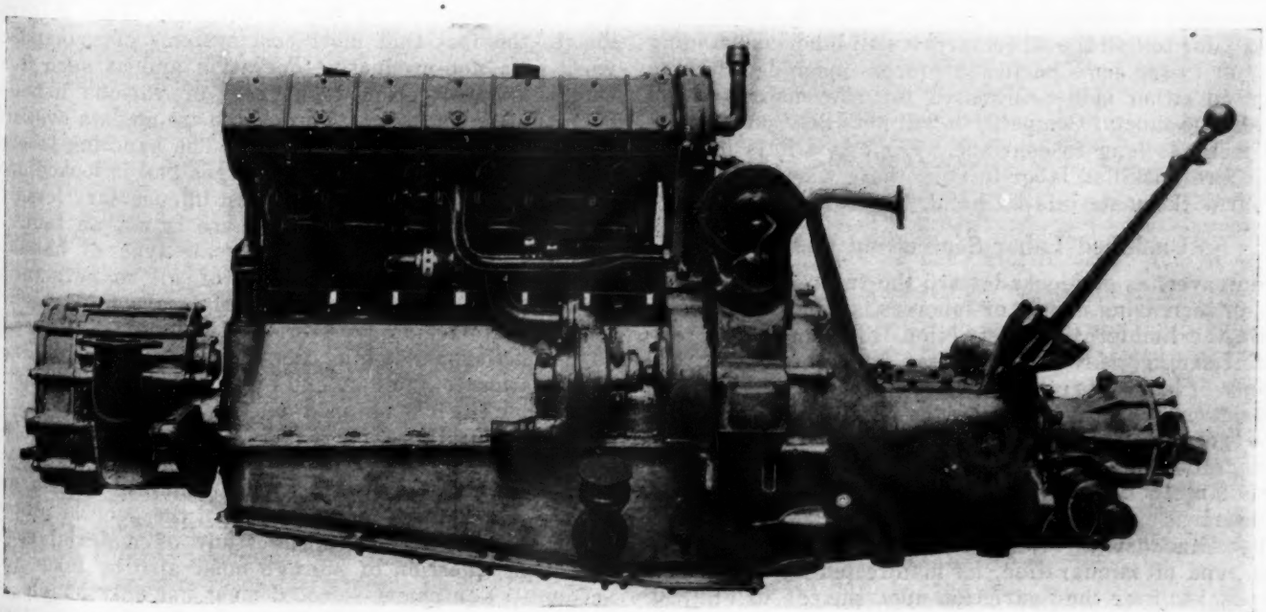
Every car in the race had a Robert Bosch magneto with the exception of the Miller, which was Delco equipped, and no ignition trouble of any kind developed. Plugs were divided between Champion, used on the winning Alfa-Romeo and Delage racers, K. L. G., and Bosch.

For the first time use was made of semi-balloon tires with a lower pressure than is customary in races. The Sunbeams had a new type of Rapson semi-balloon clincher bead cord tire, inflated to 40 lb. pressure. The Pirellis on the Alfa-Romeos and Fiats were of 5-in. section on the driving wheels and had a pressure not exceeding 40 lb. Trials had been made with 6-in. tires, but these were not used in the race. Delage used Michelin high-pressure tires. In the case of Rapson, Pirelli and Michelin, no tires were changed except as a precaution.

Brakes Receive Terrific Punishment

No race has ever been run in which brakes have received such punishment. Every car had a four-wheel equipment with mechanical operation, no brakes being fitted on the transmission. Delage and Sunbeam had the Perrot system, with a geared down servo drum on the back of the gearbox. Fiat used the same type of hydraulic servo mechanism as on one of the standard models, the pumps being the bottom of the gearbox and using the gearbox lubricant. The general design is similar to that of last year's cars, the shoes being opened by a toggle joint by means of a rod going through the steering pivot. To take the control around the angle from the bottom of the steering pivot to the axle, a bicycle type chain, running over a small pinion, is used. This chain, although strengthened since last year, broke on Bordino's car.

Fiat had an interesting mounting of Hartford shock absorbers to resist the torsion of the front axle by reason of the application of the brakes. Instead of the usual pair of arms, a parallelogram arrangement was made use of, which in a very large measure relieved the torsion on the axle. Fiat and Alfa-Romeo used an axle of circular section from the spring seats outward. Bugatti had a circular section one-piece front axle, the center portion being bored out and the two ends practically solid. This result was obtained by boring out the entire axle and then reforging to close up the ends. Sunbeam and Delage had a three-piece built-up front axle, the center being I section and the two ends circular section.



While the Sunbeam powerplant shown here was the only one to have the carbureter before the blower, it bore a definite resemblance to the Fiat and the Alfa-Romeo. The winning car was designed by Vittorio Jano, Bertarione assisted in the design of the Sunbeam and both were former Fiat engineers

Better Material Handling May Turn Deficits into Dollars

Economies of high grade machine equipment sometimes offset by inefficient internal factory transportation. Recent conveyor studies point way to new savings.

By M. L. Begeman*

EVERY industrial organization looking toward maximum economy must include in its program a careful study of the handling of its materials. Competition is keen, unskilled labor expensive, and while in other departments economies have long been practiced, here is a profitable field for developing greater efficiency.

The handling of materials in a plant by machinery is by no means a new idea. Many industries employing continuous processes have over a period of years developed this phase of engineering to a high degree of efficiency. The definite continuous flow of their product made it easy to select a type of handling equipment to meet their needs. Other industries whose products are heavy or bulky have developed the art of mechanical handling because of the physical impossibility of handling their product by any other means. The steel industry is a good example of this type. Many industries having a more complicated flow of product or a variety of product have, of course, been slower in adopting mechanical equipment.

In spite, however, of the advantages demonstrated by these developments in the mechanical handling of materials, the great majority of the industries have so concentrated their efforts to their processes, their equipment, and their management in general that they have entirely overlooked the vast economies possible by proper movement of material and product. One does not have to look far to find the wheelbarrow still laboriously doing duty or to see some perfected process machine with the floor on either side being used for raw materials and finished products. Competition will not allow such wasteful methods long to continue. Even now it is difficult to secure unskilled labor to push these wheelbarrows or to carry the materials by hand.

Unskilled Labor Scarce and Costly

Moreover, as one looks toward the future the prospect for an increasing supply of laborers is not at all bright. Since the Immigration Restriction Bill signed by President Harding, May 19, 1921, has gone into effect, the supply of laborers from abroad has been decreased. The restriction, which is based on the census of 1910, limits to a great extent the southern and eastern European immigrant—the type of immigrant that in the past has been largely used for the unskilled handling work in industries.

The tendency is toward still further restrictions of that type of immigration, as manifested by the recent proposal to base the restriction upon the census of 1890, allowing immigration from each country equal to 2 per cent of the people of that nationality in the United States at that date. This cuts down the number of possible immigrants from southern and eastern Europe tremendously, but still maintains relatively large quotas from such countries as Great Britain, Germany, Norway, and other western European countries.

The average immigrant from these countries is better educated than the southern or eastern European immigrants and less apt to fall into the laboring class. It is also worth noting that more skilled labor has entered this country than has departed each year since 1910, while almost the reverse is true regarding unskilled labor. During the years 1915, 1918, 1919, 1920 and 1922 there has been an excess of departures over admissions and this has caused a large decrease in the available supply of laborers. If the emigrations continue at the same rate under present restrictions, industry will no longer be able to depend on immigration as an important source of labor supply.

Inefficiencies Are Not Always Obvious

One condition which has delayed a general recognition of the need of materials-handling equipment is the fact that it is difficult to point out specific inefficiencies. Even now in those industries using mechanical equipment it is estimated that not more than 5 per cent are using such equipment to its best advantage. This is partly due to the fact that most cost systems class handling work as a non-productive operation and as such it receives little attention. The cost of various handling operations is not itemized and there are no data available from which to make an analysis. The handling labor is hidden away in the overhead charges and is looked upon as a necessary evil rather than an unnecessary loss.

It may be safely said that there is not an industry which does not have need for some type of handling equipment. The general cycle of all manufacturing plants is about the same. Materials are first received and put into temporary storage. From storage they go to production and while there move from one machine or operation to another, and often from one department to another till it is shipped out of the plant.

Considering this cycle it is to be noted that it involves both movements and rests. In other words, the storage bears a close relationship to the handling system, and merely represents a halting place in the general process of movement. Hence in the study of material movements the question of storage must also be taken into account. Equipment selected must not only handle the materials economically, but should also facilitate their handling in and out of storage and if possible reduce the time in storage.

*Excerpts from a paper read before the American Society of Mechanical Engineers.

Present-day manufacturing equipment consists of but two main divisions: the production equipment which performs the various operations, and the equipment which serves to bring the material to and from the production machines. Machines and processes of the first type have in the past received most of the attention and as a result have been perfected to a high degree.

It remains, then, that any economies practiced will be concerned largely with the handling equipment. Many manufacturers who have highly developed automatic machines and an otherwise efficient organization are losing much of the value of their development by discounting the importance of factory internal transportation.

Although the handling equipment has not come into use nearly as much as it should, it certainly is not because such equipment has lacked development and perfection. The last ten or fifteen years have seen a great improvement in this type of equipment.

Tends Toward Standardization

Manufacturers have brought about much standardization along this line and are continually investigating new possibilities for labor saving. Special problems that come up are given special analysis and equipment designed if necessary which will meet the needs that are presented.

The economies effected by a properly installed handling system reach practically every department of an industry. It is most directly concerned, of course, with the production operations.

By eliminating the lifting and carrying of the materials by workers and effecting its movement by mechanical conveyors, materials are brought to the machinery at the desired rate for best operation. Delays caused by tardy arrival of materials are common when relying on human effort for the supply. With properly installed mechanical equipment the product as it is finished is immediately moved on, preventing accumulation and cluttering of floor space.

The strict adherence to the above principle is one reason for the economical production at the Ford factories. Wherever it is possible materials are brought to the machines and taken away by mechanical means. Any one going through the main plant at Highland Park cannot help but notice the many continuous overhead conveyors bringing a steady supply of castings and forgings from the receiving platforms and the forge plant and delivering them to their respective departments.

Conveyors Do Double Duty

These same conveyors in many cases take the same parts after they have been machined and carry them on to the finished stores or to the assembly line. Under this system there is no waiting for parts and practically no accumulation of product around machines. The use of man power for carrying purposes is eliminated, and as a result the cost of production is reduced to a minimum. Increased production will always be the result of keeping the product on the move.

In many factories the assembling processes constitute an important phase of the production work. Here, again, conveying equipment helps to bring about increased production by speeding up such processes. Assembly conveyors, such as are employed in the automotive industry for motor and chassis assembly, keep the product on the move at a definite predetermined rate. The men along the line do not have to move from one place to another, but rather the product being assembled is brought to them.

In such a capacity the conveyor acts not only as a carrier of parts, but a pacemaker as well. The assembly operations are all coordinated and each man must perform his operation as the product moves by. The increase in production by the use of such assembly methods is obviously much larger than would ever be possible by allowing one or two men to assemble a unit complete. It should also be noted that there is a great improvement in the assembly, as well as the realization of the increase in production.

Like economies are also possible in small-parts assembly where the operations have usually been performed on ordinary work benches. For example, in one of the sub-assemblies of a plant employing such methods, a plate is fastened to another part by means of four screws. One man does nothing but put the plates on the parts as they move by. Two other men put the screws in position for tightening down. The next two men drive down the screws with automatic screwdrivers and as the parts move by they are tested for tightness by still another workman. Here a relatively simple operation, that of screwing down a plate, is subdivided into four unit operations.

Specialization of this sort develops unusual speed and dexterity on the part of the operator and cuts down to a large extent the operating time. However, this saving must not be lost by poor methods in moving the product along. Equipment should be installed which moves the product without interruption and without any effort on the part of the workman.

Production Is Increased

It can be seen, therefore, that by the use of the proper materials-handling equipment production is increased by—

The elimination of delays caused by slow movement of materials.

The general improvement of material routing through the plant.

The improvement of working conditions, and

By speeding up of assembly processes.

Along with increased production materials-handling equipment also brings about a greater speed in the movement of the product through the plant. These two benefits are very closely related and to some extent are dependent upon one another. However, in many cases the essential requirement is speed, and for this reason it may be mentioned separately as one of the benefits of materials-handling equipment.

A typical example where speed is an important consideration is in the modern mail-order house. Distributors and handlers of perishable products are also interested in equipment that cuts down the time element. Loss due to spoilage is greatly decreased and the service to the customer vastly improved.

Speed in Removing Product Essential

In other industries, speed in removing the product is essential for machines turning out a large volume of product. This is particularly true of woodworking equipment, where many of the modern high-speed machines are capable of turning out quantities of product sufficient to keep several men occupied carrying it away. Other parts, such as fenders and hoods, that take up a large space when completed, must also be hurried on out of the way to prevent congestion. In all of these examples the speed resulting from the use of conveying equipment lessens the possibility of the various departments becoming clogged and a clearer idea is reached regarding the rate at which the manufacturing can be scheduled.

Perhaps the most valuable result of increased speed

in moving the materials about is that less material is required at any one time in the process of manufacture. Cutting down the inventories of the goods in process helps to bring about a rapid turnover in the plant and permits operating with a minimum amount of capital. This fact is appreciated if it is kept in mind that idle material is a dead investment, the interest on which represents a total loss.

Thus it can be seen that the increased speed obtained by the proper selection of materials-handling equipment results in many economies. They are respectively—

Increased service to the customers.
Lessened spoilage of perishable products.
Decreased possibility of materials clogging departments.
Rate of output easily determined.
Reduction of materials inventories in process, and
A decrease in the amount of capital necessary to carry on business.

In many industries, such as those manufacturing cement, sugar, flour, or chemicals, the processes are standardized and the manufacturing problem is largely one of bringing the materials to the various processes and disposing of the product after the operation is complete. A large proportion of the labor used in such a plant is unskilled, employed merely for the purpose of trucking the material about the plant. Failure to take advantage of this possibility for economy either imposes a heavy penalty on the profits of the industry or increases the cost of the article to the consumer.

Personnel Reduced

Aside from the fact that the labor expense is reduced by the substitution of mechanical equipment for laborers, there are other reasons for reducing the personnel to the lowest number possible. Plants equipped with handling equipment have a better class of workers, as it is the unskilled men and the shirkers that are mostly eliminated. The labor turnover is reduced by the removal of this type of employee and by the improved working conditions. Relieving the employee of physical labor makes his work more pleasant and enables him to work to his best advantage. Accidents are decreased as improvements are made in the working equipment. Cleaner surroundings and lack of confusion are also the direct results of handling equipment and tend to improve further the morale of the employees.

Many examples could be cited showing actual labor savings that have been made by various manufacturers. In every case the figures prove that mechanical power in handling materials is cheaper than man power.

Labor wages are saved.
Turnover decreased, and
Many men are released from hand labor to more productive lines of work.

Elevating Devices Save Storage Space

The use of certain types of elevating and tiering devices also assists materially in economizing storage space. Too often the storage space is measured only by the floor space and little regard is given to the space above. As a matter of fact, the proper use of this overhead space frequently has the effect of doubling the floor space. In many plants and warehouses, materials have not been piled high on account of the high labor cost involved. However, handling equipment is now available that will permit the piling of materials to the ceiling with greater ease than hand handling at any height. This equipment makes all the space in the room, excepting that necessary for aisles, available for storage. Practicing economy of storage space to this extent often saves the initial expense of additional floor space.

The use of materials-handling equipment for economizing storage space applies to railway terminals and large warehouses as well as to industrial plants. Investigation has often revealed the fact that the terminal charges are many times the haulage charges, particularly in the case of short hauls.

Summing up in a few words, the proper selection and installation of materials-handling equipment saves space in industrial plants through—

The elimination of storage spaces between operations.
The speeding up of the movement of the materials through the plant.
The hastening of the loading at the point of shipment, and
The economical use of overhead space.

More Business with the Same Space

Plants thoroughly equipped with labor-saving equipment can generally turn out much more business with the same plant than without such equipment. Looking at the situation from a different angle, the thoroughly equipped plant can turn out the same amount of business, but with less equipment and fewer men. In either case the total cost per unit of output is smaller than if operating without labor-saving equipment.

Another saving in overhead charges results from the elimination of hand labor. Considered as a non-productive operation, this type of work is classed as indirect labor and is one of the large items which goes toward making up the total overhead expense.

Decreased supervision, brought about by the installation of equipment that keeps the product on the move, represents another saving in the overhead expense. Materials handled mechanically do not need the supervision that is necessary when the same product is handled with hand labor. Definite routes along which the material is to travel are laid out. By utilizing the force of gravity and mechanical power to the fullest extent this movement is maintained continuously.

Smaller Stock Inventory Necessary

Carrying on hand unnecessary quantities of materials is one of the common and frequently unnoticed sources of overhead expense. Capital is not only tied up, but the interest is lost as well. Taxes, insurance, rent and depreciation all continue and greatly increase this expense. Reducing this expense reduces another item carried in the overhead.

It may be concluded, therefore, that overhead expense is effected by materials-handling equipment and should be given consideration. The savings effected are—

Greater output of plant.
The elimination of non-productive labor.
Decreased supervision, and
A reduced inventory.

Management is relieved of many of the details of controlling production by the use of materials-handling equipment. The more automatic the system, the fewer number of labor workers required.

Inventories of materials in progress likewise remain balanced, eliminating the delays and troubles caused by underproduction of some products and overproduction of others. Uniform output enables the management to guarantee quick service to customers and also helps in the formation of sales policies.

Recent Books and Papers Offer Interesting Variety of Business Reading

"Physical Properties of Materials," third edition of "The Gasoline Automobile," "Budgetary Control in Manufacturing," "Nickel and Its Alloys" and "Lead Base Bearing Metal Alloys" included.

IN 1920 the Bureau of Standards assisted the Smithsonian Institute in revising its Smithsonian Physical Tables, and as the Bureau received frequent calls for information regarding the properties of materials of construction which could be answered by reference to the Smithsonian Tables, it was decided to publish them. They appeared as Physical Properties of Materials, Circular No. 101 of the Bureau of Standards.

The first edition, which was compiled by A. H. Anderson, assistant engineer-physicist, was soon exhausted, showing that the work met a demand, and a new edition, greatly enlarged, has now been brought out. The general title, Physical Properties of Materials, is self-explanatory, but it may be stated that in addition to the material included in the first edition the new volume contains data on the strength of materials which have appeared in technical literature during the past few years. There have been included particularly data on the properties of metals at elevated temperatures, their fatigue and impact resistance, etc. The physical properties of woods obtained by the Forest Products Laboratory have been included also.

It may be judged from the above that the new edition of Circular No. 101 of the Bureau of Standards contains information that will prove helpful to every engineer. Copies of the circular can be obtained at 40 cents each.

THE Gasoline Automobile, a popular treatise by George W. Hobbs, Ben G. Elliott and Earl L. Consoliver, published by McGraw-Hill Book Co., Inc., of New York, has been revised and rewritten by the two last-mentioned of the original authors and has appeared in a third edition. The book was prepared in the Extension Division of the University of Wisconsin and is evidently intended as a textbook for those who want to acquaint themselves with automobile mechanisms as owners, drivers or repairmen, for which purpose it seems to be well suited.

In the latest edition such recent developments as eight-cylinder-in-line engines, four-wheel brakes and mechanical gearshifts are covered. The book coming from a State university, it is rather surprising that the authors make use of term "foot-pedal." The price is $3.

THE Ronald Press Co., New York, have just published a book on "Organization and Budgetary Control in Manufacturing" by the superintendent and the assistant superintendent of the Delco Light Co., Thomas B. Fordham and Edward H. Tingley.

In their preface they state that "While there are many articles and books on this subject, most of them are written from the standpoint of presenting a certain method and concentrate on one detail or another of the production and control processes." . . . Their object is to explain definitely methods which may be accepted as fundamental rather than debate the merits of different types of organization or control systems.

Chapters are included on "Application of the theory of organization to small industries," "Forecasting the future of the business," "Controlling a business through the budget and the balance sheet" and "The analysis of a business for the elimination of losses."

The price of the book is $3.50 and it may be obtained from the publishers.

IN answer to a considerable number of requests for information concerning the properties, statistics and manufacture of metals and alloys, the Bureau of Standards has issued a paper covered book on "Nickel and Its Alloys." This is one of a group of booklets being issued from time to time which deal primarily with the physical properties of various metals and alloys.

All of the best information which the bureau has as a result of its tests and investigations, together with available published tests and investigations, are included. The endeavor is to reproduce only such data as have passed critical scrutiny and the probable degree of accuracy is indicated.

Various physical properties of pure and commercial grades of nickel are described, together with a discussion of the relation of these properties to the composition and treatment of the material. The properties and applications of nickel and its commercially important alloys, such as monel metal, nickel steels, ferro-nickels, copper-nickel and chromium-nickel alloys and other alloys containing nickel, are dealt with.

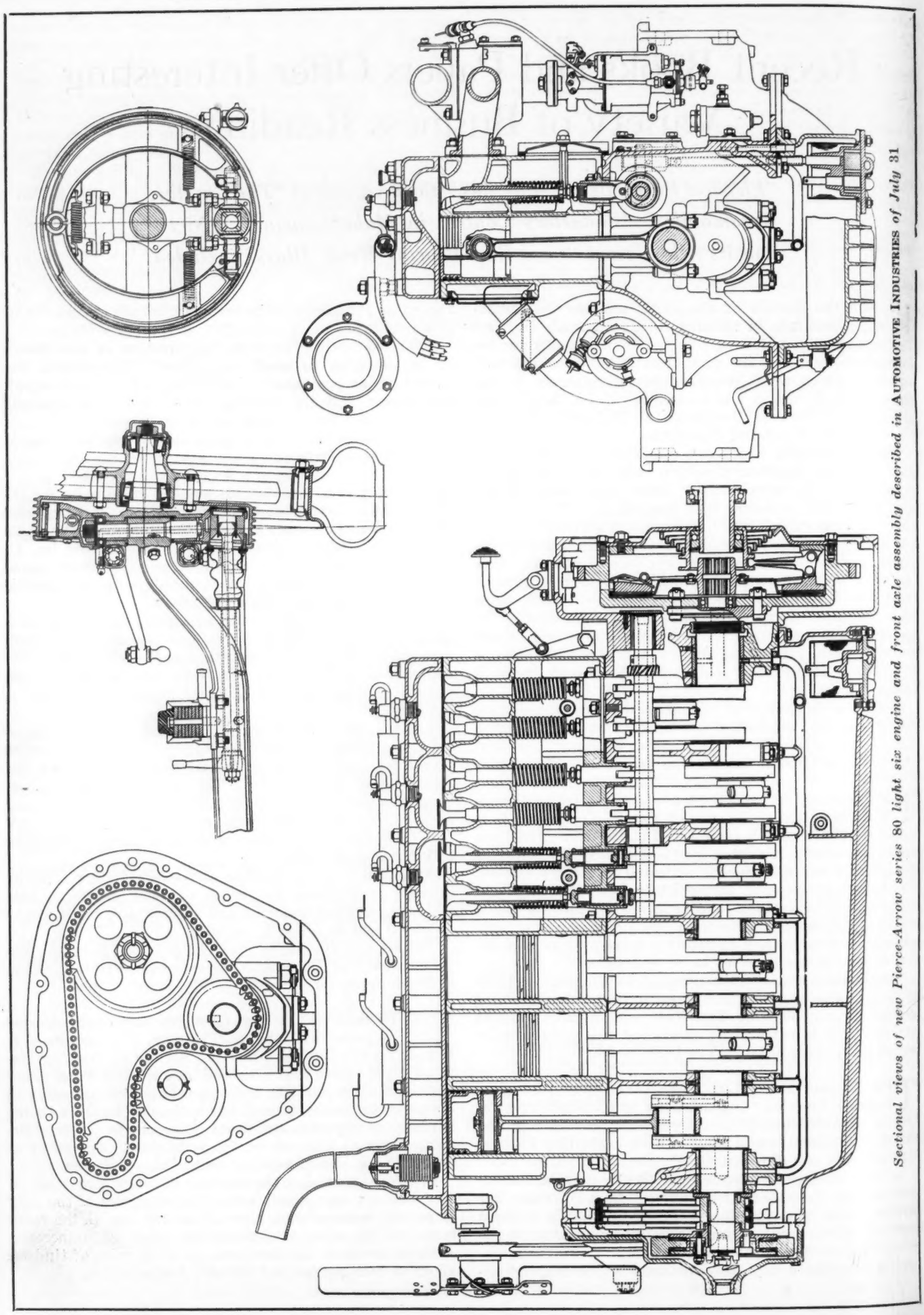
Attention is given to those alloys now finding wide industrial applications by reason of their electrical, heat and acid resisting qualities, and an extensive bibliography on nickel and its alloys is included.

"Nickel and Its Alloys" may be obtained from the Superintendent of Documents, Government Printing Office, at Washington for 40 cents.

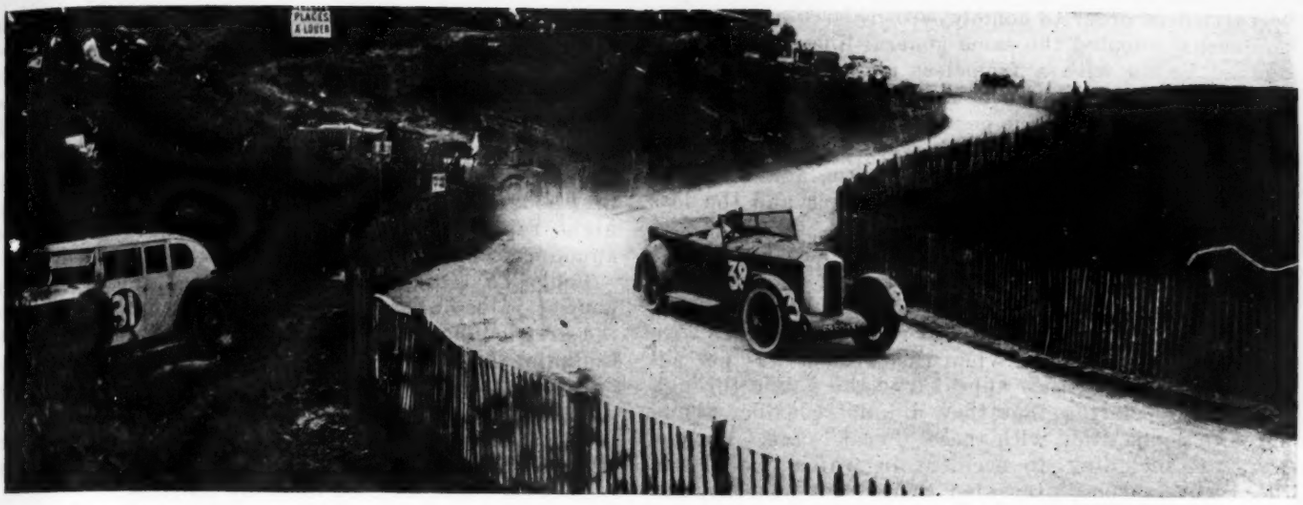
TESTS made at the Bureau of Standards and reported in a paper by John R. Freeman, Jr., and Paul F. Brandt read before the American Society for Testing Material, have shown that with lead-base bearing metal alloys additions of zinc, arsenic and copper at normal and elevated temperatures cause a small but noticeable increase in the hardness of the alloy and in its resistance to deformation, particularly at loads above the yield point. The effect of copper is not so noticeable as that of zinc and arsenic.

In the tin-base alloy the presence of a low percentage of zinc does not appreciably affect the properties of the alloy at normal temperatures, although at 100 deg. C. the resistance of the alloy to deformation appears to increase. Arsenic increases the hardness and yield point of tin-base alloys at both normal and elevated temperatures.

Details of New Pierce-Arrow Engine



Sectional views of new Pierce-Arrow series 80 light six engine and front axle assembly described in AUTOMOTIVE INDUSTRIES *of July 31*



Dauvergne in his winning Peugeot is shown on a twisting, down-hill section of the difficult Grand Prix course. The Steyr with its white fabric sedan body is shown at the extreme left

Unique Body Designs Featured at French Grand Prix for Touring Models

Qualifications for entry included eight hour preliminary night run, limited gasoline consumption, driving without a mechanic, and a car only partially standard, equipped with windshield, etc.

THE French Touring Grand Prix, held at Lyons, France, was unlike most of the stock car races and endurance runs America has seen.

Thirty cars in rows of two were ranged silent in front of a brilliantly lighted stand awaiting the hour of midnight and the word "Partez!" Each of the cars in the two, four and five passenger class was required to run eight hours over a difficult course with no lights other than regular touring equipment, on a limited quantity of gasoline, and to carry ballast equivalent to one, three or four passengers in addition to the driver. And this was only the preliminary, elimination race.

Eight-Hour Elimination Run

Of the eight hours beginning at midnight, five were run in complete darkness. The cars were not required to be standard in many respects, but they were required to average 10.7 miles to the American gallon in the five passenger class, 15 miles in the four passenger class, and 24 miles in the two passenger class at a speed of 43½, 37 and 34 m.p.h. for the respective classes.

Only five of the thirty cars which started came through without some penalization—Cotton-Desgouttes, Georges Irat, Cottin-Desgouttes, La Buire, Steyr—but the loss of points for many others was extremely low. Stopping the engine, failure of the lighting system, use of the crank, and failure to maintain the required average speed were reasons for imposing penalties.

Twelve of the thirty cars, in addition to the five who made clean scores, qualified for the final, daylight reliability run, of something less than two hundred miles, for which there was a slightly higher gasoline allowance. Of these seventeen cars, a four-cylinder, sleeve valve, five passenger Peugeot, driven by Christian Dauvergne, came in first, averaging 56 m.p.h.

Two Cottin-Desgouttes in the four passenger class came next, one averaging 55.7 m.p.h., the other followed one-fifth of a second later.

Three Mathis cars in the two passenger class, which were required to average 24 miles to the gallon, were the only ones to finish in their division, with an average speed of 47½ m.p.h.

While the cars competing were not required to be standard in many of the fittings and details, the bodies had to be built to certain minimum dimensions, spare wheels or tires had to be carried on the car itself, and they had to be equipped with hood, windshield, etc. Only one man was allowed aboard and he was allowed no outside assistance.

In an effort to break away from accepted body lines and reduce head resistance, Voisin built a set of cars in which the body formed the frame, the general design being similar to that of an airplane fuselage and the construction being of wood, aluminum and duralumin. With this design, not unlike the Lancia now on the market, the passengers' feet are below the level of the drive shaft and the gearbox appears between the driver and the front seat passenger.

Voisin Design Gains No Advantage

Extremely low weight was obtained with this construction, but Voisin gained no advantage from it, because the rules called for a minimum of 3086 lb. for five-passenger machines, and 900 lb. of dead weight had to

Sectional views of new Pierce-Arrow series 80 light six engine and front axle assembly described in AUTOMOTIVE INDUSTRIES *of July 31*

be carried in order to comply with this rule.

Senechal adopted the same general lines of construction as Voisin with a frameless chassis, but the rear wheels were inclosed and the running boards were inside the body according to the general ideas of Forostowsky. The driver of one of these cars was said to have dozed during the night and ran off the course, and the other was disqualified by reason of a torn sack and the loss of 20 lb. of ballast.

Rival firms claimed that this type of body would give Voisin and Senechal cars an advantage of at least 6 m.p.h. over other machines and lodged a protest on the ground that the construction was not in accordance with the spirit of the rules. When this protest was not admitted by the jury, they appealed to the public through the press, declaring that they did not consider themselves in competition with these "Freak" cars. Various incidents, including an accident in which one of the Voisins overturned, prevented them from winning, but the design nevertheless showed that it gave an advantage in the matter of speed.

For practically the first time in history closed cars were used in competition with open cars in a long-distance road race. Rutzler, driving a Steyr with an all white sedan body built of wood and fabric leather in the five passenger class, was one of the three leaders in the first hour of the daylight race, having gone through the night reliability run with a perfect score, and then announcement was made that he had overturned.

Peugeot's Knight type engine and the Cottin-Desgouttes valve-in-head engine had dry sump lubrication, the first having the whole of the oil supply in a chassis tank and the latter having an oil reservoir and radiator on the right-hand side of the car. Immensely high compression ratios were used, and engine speed was fairly low, while every car in the race had mechanical four-wheel brakes. The winning car finished without lifting its hood and without touching its tires.

Eight-in-Line Engine Powers New Elcar

One-piece windshield is employed, while hydraulic four-wheel brakes and balloon tires are provided as standard equipment.

TO its regular line of fours and sixes the Elcar Motor Co. of Elkhart, Ind., has added a new model known as the 8-80, equipped with the Lycoming eight-in-line engine. The engine, fully described in AUTOMOTIVE INDUSTRIES for May 15, has 3⅛ in. bore and 4¼ in. stroke, giving a piston displacement of 260.7 cu. in. The wheelbase is 127 in.

Engine equipment includes Swan high turbulence intake manifold, dual flywheels and automatic oil regulation, with pressure feed to the main and connecting rod bearings. Oil flow is increased with increase in throttle opening.

Body styles available on the 8-80 chassis include a seven-passenger sedan, listed at $2,765; a five-passenger demi-sport phaeton, with trunk in rear, listed at $2,165; a seven-passenger phaeton, with trunk in rear, listed at $2,265, and a roadster, listed at $2,315, f.o.b. Elkhart. Open cars are trimmed in genuine leather and the sedan in mohair. Nachman springs are used in the cushions. A one-piece windshield is employed.

Both open and closed models are painted Thebes gray with black and striped moldings or light coach blue with black and striped moldings. Headlight control is by means of dimmers. Cowl lights, combination stop and tail light and two instrument board lights are provided.

What Equipment Includes

Other equipment includes an automatic windshield wiper, ammeter, oil gage, Motometer, and gasoline gage on instrument board. Bumpers are furnished front and rear, while 32 x 6.20 in. balloon tires are fitted as regular equipment. These are supplemented by Gabriel snubbers designed for use with low pressure tires.

Provision for carrying the small tools is made in a convenient compartment built into the left front door. Closed models are provided with heaters.

Braking is effected on all four wheels by means of the Lockheed hydraulic system, the brake drums being 16 in. in diameter and 2 in. wide. Front springs are 2 in. wide and 38 in. long, while the rear springs measure 2½ in. wide by 58 in. long. The chassis is lubricated by the Alemite system.

To facilitate easy steering the Ross cam and lever are provided with ball bearings. Salisbury axles are used front and rear. The bevel gear reduction is 4.7 to 1. A Borg and Beck single-plate clutch with Warner three-speed gearset are embodied in the 8-80 chassis.

Davis Announces 1925 Models

IMPROVED body lines, dual-tone finishes and Lockheed hydraulic four-wheel brakes as standard equipment, are the outstanding features of the Davis motor cars for 1925. Shipments are now being made to dealers. All models can be had in dual-tone combinations of either green or gray, at the option of the buyer.

Lockheed hydraulic four-wheel brakes are now standard equipment at no added cost. For the past year, these brakes have been extra equipment at additional cost. The brakes are of the external contracting type, operating on 12 in. brake drums, both front and rear. The Ross cam and lever steering gear has been adopted as equipment throughout the Davis line.

The Davis 1925 models include two series, the Series 90, a "light six" with a wheelbase of 115 in., and the Mountaineer Series 91, a larger and more powerful car, built on a wheelbase of 118 in. The Series 90 is powered by the 7-U Continental Red Seal engine, while the 8-R Continental Red Seal engine is used in the larger series.

The Series 90 models include the Phaeton, a five-passenger touring car; the Legionaire, a four-passenger sport model, the Man o' War, a three-passenger roadster, with room for two additional passengers in a jump-seat; the utility brougham, a three-door, five-passenger enclosed car; the sedan and the berline sedan.

The Mountaineer Series 91 includes the phaeton, a five-passenger, completely equipped touring car; the roadster; the utility brougham; the sedan and the Berline sedan.

Balloon tires are extra on all models.

Comments from Some of Our Readers

Editor, AUTOMOTIVE INDUSTRIES:

We have received additional information on the part of our Government regarding automobile insurance. Each Canton (State) in Switzerland has the right to issue laws for insurance of motorists.

Eighteen of the twenty-two Cantons have entered into an agreement which has the provision that the compulsory insurance of the motorists is required, which is based on the same principle. The four Cantons, Unterwalden, Zug, Grisons and Geneva, have not signed the agreement and do not, therefore, have the compulsory insurance as have the other Cantons.

According to Article 11 of the agreement, the license will only be issued to the operator or chauffeur if the owner of the car can prove that he has taken out an insurance policy for liability to the amount of minimum 20,000 Swiss francs for one automobile and of minimum 10,000 Swiss francs for a motorcycle, in order to cover any claims which may arise through an accident at which a third person is killed or injured.

Proof of the insurance has to be given every year at the time of the renewal of the license and at any time at the request of the competent authorities. The insurance policy has to contain a provision according to which in each accident 10 per cent of the damage done and a minimum of 100 francs has to be borne by the insured personally. The insurance company has to cover all damage for accident caused by the owner of the car personally or by any other person who drives the car with the permission of the owner.

A new Federal law has been proposed and is at present being discussed by the Swiss Congress. According to the proposed law as it stands today the compulsory insurance is provided on the whole territory of the Swiss Confederation, including even the foreign motorist touring in Switzerland temporarily. However, many changes may be made in this or any other respect.

CONSULATE OF SWITZERLAND.
Victor Nef, Consular Attaché.

Explaining Registration Losses in Maryland and District of Columbia

Editor, AUTOMOTIVE INDUSTRIES:

The leading article in the July 17 issue of AUTOMOTIVE INDUSTRIES, giving results of the semi-annual survey of automobile registrations, was found very interesting to us, as it presents in detail the trend of sales and progress of registrations by States.

The losses in car and truck registration in the District of Columbia for the period from July 1, 1923, to July 1, 1924, and the losses in Maryland and the District of Columbia for the period from Dec. 31, 1923, to July 1, 1924, are somewhat misleading.

There has been a duplication in Maryland and the District of Columbia of registrations, since many motor cars were registered in both places. In 1923 there were 27,246 Maryland cars registered in the District of Columbia, and in the same year the District of Columbia office of the Commissioner of Motor Vehicles of Maryland registered 41,251 vehicles to residents of both the District of Columbia and nearby Maryland. Mr. Eldridge of the American Automobile Association here estimates that there were about 25,000 District of Columbia cars registered in Maryland during 1923.

You will see from the above that the decrease in the registration figures which you have published in your issue of July 17 is due to the former duplication of registrations in Maryland and the District of Columbia rather than to decreased sales or from other causes. This condition will not exist in 1924, for the reason that the District of Columbia and the State of Maryland have made a reciprocal agreement whereby the residents of each of these territories are given full reciprocal privileges such as exists between other States.

This was not accomplished, however, until Congress passed a law creating a gasoline tax of two cents per gallon, which corresponds to the tax in Maryland, so that both territories are on the same basis.

We are submitting this information to you with the idea that you may want to correct the erroneous impression that sales have declined in Maryland and the District of Columbia, which your article has no doubt created and which must be inexplicable to the reader.

PERCY OWEN,
Chief, Automotive Division, Department of Commerce.

A PRINTED report covering the dimensions of flat head, round head and oval head wood and machine screws; filister head machine screws; and flat-head, button head, oval fillister head and flat fillister head cap screws has been released by Sub-Committee No. 3 of the Sectional Committee on the Standardization of Bolt, Nut and Rivet Proportions and is being distributed for comment by the A. S. M. E. When the comments are in the Sectional Committee, which is sponsored jointly by the S. A. E. and the A. S. M. E., will take action on the report.

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

American Imports to Belgium Decrease

A REDUCTION in the importation of automobiles into Belgium from the United States is shown in compilation of figures just completed by the U. S. Bureau of Foreign and Domestic Commerce, covering the fiscal year 1923-24. The automotive imports for that year from this country totaled, for passenger cars, $2,009,000, compared with $2,500,000 imported from the United States during the fiscal year 1922-23.

The largest loss, to the automotive industry, insofar as Belgium's foreign trade was concerned, was in trucks, which declined from $1,090,000 for the year 1922-23 to $383,000 for the fiscal year ending June 30, 1924.

The trade balance, for all commodities, show a decrease of about $1,500,000, being $102,000,000 for the past year and $103,600,000 during the preceding fiscal year. Imports from Belgium to the United States show an increase of 12 per cent.

Tires Imported Here

AMERICAN imports of rubber tires and tubes for automobiles and motorcycles from France, England and Canada during June, 1924, were valued at $227,000. This is the highest value reached since January. Following are the respective values of the imports from these three countries for the first six months of the present year: January, $88,265; February, $81,113; March, $214,340; April, $165,063; May, $189,660, and June, $227,000.

A total of 162,174 long tons of crude rubber was imported into the United States during the first six months of 1924. This is as compared with 195,669 long tons imported during the first six months of 1923.

The value of the tons of crude rubber imported during the first six months is given at $87,407,750 as compared with $117,324,206, which was the value of the tons imported in the same period in 1923.

Automotive Products Rank First

OF all commodities pushed in foreign markets by the agencies of the Federal Government, automotive products rank first, according to a tabulation of statistics completed by the Bureau of Foreign and Domestic Commerce.

Approximately one out of every eleven inquiries handled by the Bureau with its fifteen varied divisions relates in some way to the sale of automotive products abroad.

For the total 15 divisions for the week ending July 26, the latest week available, a total of 35,501 inquiries were handled of which 3499 were addressed to the automotive division and related to the sale of automobiles, trucks or parts, outside the United States.

From July 1, 1923, to July 1, 1924, the Bureau handled a total of 1,168,972 inquiries relating to foreign trade, of which 105,459 related to automotive products. The figures relate only to the Washington office of the Bureau and do not include the branch offices.

Predicts Two-Hour Flight to Europe

FLIGHTS between Europe and America in two hours at an altitude of 10 miles and with 2000 hp. motors, are forecast by S. Lindequist, a widely known Swedish airplane constructor, in a statement published by a leading Stockholm paper, and just forwarded to the Automotive Division of the Department of Commerce.

One of the greatest aims in aviation in the immediate future should be to cut down the flying time between continents, says Mr. Lindequist, and this probably can be done by flying at extremely high altitudes. The effect of gravitation decreases with the increase in altitude, and it has been estimated, he says, that a plane which has a speed of 100 miles an hour near the surface of the earth can attain a speed of 1200 miles an hour at an altitude of about 10 miles.

At such a height the rarity of the atmosphere would constitute a disadvantage both to the ordinary motor and the ordinary propeller. But this difficulty can be overcome, declares Mr. Lindequist, by using a propeller with adjustable blades so that the pitch of the blades could be altered with the density of the air, and by using special compressors for the motor which would compensate for the decrease in barometric pressure at high altitudes. Such a motor would probably have to develop about 2000 hp.

New Zealand Markets Vary Little

NEW ZEALAND is maintaining its position as one of the leading markets for cars and trucks made in the United States, it is announced by the Automotive Division of the Commerce Department following compilation of statistics for the first six months of this year.

During the first half of this year, New Zealand has held twelfth place among the passenger car markets of the United States, and fourteenth place among truck markets as compared with eleventh and fourteenth, respectively, during the year 1923. Shipments to New Zealand so far this year have been only slightly less than half of those during the twelve months of last year, showing that in general the automotive trade with that country is well sustained. The latter half of 1924, if consistent with past years, will see the usual spring boom, since seasons are reversed in this land south of the equator.

Editorial

Stable Parts Supplies

THE coming year may bring about some altered relationships between parts suppliers and car manufacturers. The state of mind of parts manufacturers is gradually changing in some cases as regards the desirability of original equipment business which does not yield a profit. In several cases definite plans are being made to go out after new business on a profit making basis and to ask for sufficient detailed information about purchasers' production and dealers' stocks to permit more intelligent handling of the production problem in the parts plant.

The president of one of the biggest car manufacturing plants in the country expressed the opinion the other day that the changing of parts supply sources simply to save a few cents here and there is unprofitable in the long run. He is supported by more than one farseeing executive when he says that his company never finds it profitable to take orders away from a particular parts maker so long as the prices charged are reasonable and so long as the quality of the product and service are satisfactory. He added that no philanthropic ideas were behind this policy—just plain **good business.**

The real value of a stable source of supply doesn't show up until peak production times begin. Then it is that the car manufacturer who has patronized a particular parts maker steadily benefits by having specially rapid service just when he needs it most. Moreover, the stability in production in the parts plant generated by a constant stream of orders from the same source helps materially to cut costs.

It is generally agreed that the automotive industry is built on a firm foundation which is sufficient in the long run to provide reasonable profits for everybody engaged in it. Modification of some present practices will be necessary, however, before this ideal situation is realized.

Truck Drivers' Seats

IN England there is said to be a tendency toward placing the driver's seat beside the engine on all commercial vehicles, for the very excellent reason that it affords more space for pay load on a car of given wheelbase.

There are, however, some compensating disadvantages not the least of which is the greater inaccessibility which is apt to be introduced. Also a seat beside the engine may be less comfortable for the driver, partly because it is difficult to place the steering column at a sufficient angle to bring the steering wheel into the most comfortable position. Furthermore, weight on the front wheel is increased.

It is true that, for a given load capacity, if the wheelbase of the vehicle is increased, its weight is increased also. Since first cost is very closely proportional to weight, the shorter vehicle will be the less expensive, other things being equal. Consequently, where competition is keen the short wheelbase truck should have an advantage if produced with an equal degree of economy. For use in congested traffic a truck with short wheelbase also has an advantage in maneuvering.

With these things in mind it is evident that any feasible change in design which tends to shorten the wheelbase is worth attention.

Windshield Regulators

PRACTICALLY all cars manufactured today are lacking in convenient means for quick and easy adjustment of the windshield. Most windshields are made adjustable, but in nearly all cases the driver must stop the car and often leave his seat to loosen thumb nuts or perform the other operation necessary to open or close the shield.

There appears to be no good reason why the windshield should not be adjusted just as quickly and easily as a cowl ventilator, or the glasses in doors or windows, by the use of a single lever or crank connected to a suitable operating gear.

Considerable ingenuity has been displayed in the design of inexpensive but durable and easily operated window regulators. There appears to be a similar field for the design of windshield regulators.

Scientific Advertising

WHILE experts have been inclined to criticize automotive advertising in many cases for its glittering generalities and its lack of specific appeal, some very detailed studies are going forward as to the potential and practical value of various media and their probable permanent value. One analysis is aiming to set up a relationship between car registrations by States and the circulation of various consumer media in an attempt to define more closely the possibilities of the different magazines read by the general public.

The success of efforts of this kind will be determined only by the care and intelligence with which the data collected are interpreted, but the idea is interesting as being indicative of the very detailed study which is likely to be given to specific advertising problems in the future. Many executives have come to realize that real economies are possible through a scientific allotment of the vast sums expended annually for motor car advertising.

Our Industry Today—

Steadily Improving Market Indicated by Up-Trend in Production Programs—Dealers' Stocks Show Better Movement Forward

NEW YORK, Aug. 18—A slightly better tone is being given to automobile production the latter half of the month. The up-trend in manufacturing schedules is not great, but bears witness to a steadily improving market and a continued forward movement in dealers' stocks which in some cases has virtually wiped out surpluses.

Sales volume has not developed to a high point, and spottiness still marks demand throughout the country. Sales, likewise, are not uniform among the different makes of cars. There is a somewhat improved demand from agricultural centers, but this is not yet so marked as to warrant a sharp stepping up in production programs.

Stimulus to sales has been given through the introduction of the 1925 models of cars. Most of the manufacturers planning changes in design have made their announcements and have placed new models in dealers' salesrooms. This has done away with much hesitancy on the part of the prospective buyer and has prepared the stage for what dealers look forward to be a fall season on a par with other years in the automotive industry.

Dealers Increasing Orders

Some manufacturers report that dealers are gradually increasing their orders. Regardless of the fact that in instances there are no surplus stocks, manufacturers will make no effort to force cars on the trade and plan to adhere to this policy for the remaining months of the year at least. Actual consumer demand will govern manufacturing operations and surplus stocks will be avoided.

Greater optimism pervades the industry as a result of improved retail conditions and the feeling that the improvement will become more extensive with the entrance of new buying factors into the market. Should the agricultural situation develop to any extent it will result in bringing the final quarter of the year far beyond the expectations now held out for it.

July 5.3 Per Cent Over June

The estimated July production of 258,200 cars and trucks is 5.3 per cent more than the June figure and brings the total output for the seven months of this year to 2,256,328, as compared with 2,359,238 for the corresponding period of 1923. During the seven months of 1924 a total of 2,039,702 passenger cars were produced as against 2,128,369 in the like period a year ago. The truck output for the seven months of this year amounted to 216,626, compared with 230,869 last year.

Tire Boom in Akron Now at Its Height

Present Big Production Likely to Last at Least Another Month

AKRON, OHIO, Aug. 18—Despite the drastic efforts made by some of the leading tire manufacturers here to increase their working forces to a point where immediate demand can be supplied, the more conservative observers of the industry insist that the present spurt will not be long lived.

It is estimated by these observers that the present production figures will be maintained until some time late in September or early in October, after which there will be a slump in output previous to the starting of the regular upward movement for the winter and spring production.

The upward movement has, however, reached proportions not looked for when the movement started. The stocks of the larger companies have been practically wiped out.

More than 4000 men have been added to the combined payrolls of the rubber industry in the district and more than $500,000 added to the monthly payrolls.

Bringing production up to the present requirements has proved a difficult task for some of the large producers. The Goodyear Tire & Rubber Co., for instance, has announced that it has asked all its employees to assist in bringing experienced rubber workers to Akron. Letters telling about present conditions in the rubber capital and pointing out its advantages are being mailed to prospective employees.

While one authority during the week published the statement that tire production would reach a total of 100,000 a day before the end of the present movement, this figure is looked upon as being too high. It is believed that if 85,000 tires a day is reached for the district the high mark will have been touched. This will compare with 72,000 produced a month ago and 112,000 produced at the peak for the year.

Subsidiaries of the larger Akron rubber tire companies are reported to be enjoying prosperity very similar to that experienced by the parent companies.

The B. F. Goodrich Co. reports officially that the production of tires at the Ajax Rubber Works Co., its English subsidiary, purchased early this spring, has been increased to 1000 a day and that further advances in production may be expected.

The company states that only through ownership of an English subsidiary is it possible to do a large volume of business on the islands in tires. This statement is borne out by the export figures to Great Britain during the past six months.

The Canadian subsidiary of the same company has had such a large increase in business during the past few months that a company has been incorporated as the dominion concern after being incorporated only as a provincial company heretofore. The company's operations are said to be on a very profitable basis at the present time. This company, as are other Canadian companies, is feeling the effects of better business in British colonial territories, due to the practical exclusion of foreign tires through the voluntary action of the motorists of these colonies.

The Firestone Tire & Rubber Co. subsidiary in Canada is reported to be completing a small addition to its plant constructed to take care of the gum-dipping process of tire making which the company has employed for several years. The plant is being operated very close to capacity, according to information available here. This company showed a 50 per cent increase in business during the first six months of the year over business done during the corresponding period of 1923.

Pacific Coast Operations

The Goodyear Tire & Rubber Co. subsidiary at Los Angeles is reported to be operating at close to capacity, while its cotton mills at both Los Angeles and in the East have been put on an increased production basis as far as can be learned here. The California company continues to make as good a showing during the present half of the year as during the first half, it is stated here.

Information is not yet available here, however, as to what the B. F. Goodrich Co. will do with the subsidiary manufacturing company formerly operated in Japan which was destroyed during the earthquake last year. The Goodrich company, however, states that the operation of its French subsidiary is satisfactory, although no figures are given out here regarding this concern.

Reports from some of the more important Ohio rubber companies received here during the week indicate general prosperity.

Seasonal Pace Shown By Car Makers

Production Trend Up In Detroit Section

Steady Buying Movement Prevails As Dealers Take Cars in Increasing Volume

DETROIT, Aug. 18 — Manufacturing operations in this district continue to show a gradual extension; dealers are taking cars in increasing volume as the fall season approaches, and a steady buying movement is reported throughout the country. There is little apprehension among factory executives but that the volume of buying will be steadily increased through the latter part of the year.

Investigation of actual operations in the many leading car manufacturing plants shows them to be operating at a pace thoroughly consistent with the season of the year, and a number of them running on a higher summer schedule than ever before. Though reductions are the rule in most plants, in none of these is there anything resembling a real slow pace.

Ford is continuing on a five-day basis, but in those five days is building approximately 35,000 cars weekly or a monthly schedule of close to 150,000. This is only about 30,000 behind the former maximum schedules and is about 20,000 lower than the totals that were being made in the mid-year months in 1923. Chevrolet is getting ready to increase its schedule and will get into much greater volume in September. The latter is extending its activities in producing de luxe model cars, which means somewhat lower totals than would be possible concentrating on standard models.

Some Pushing De Luxe Models

There is a gradual trend toward the fully equipped and special paint job cars this fall, induced to a considerable extent by the prospect of enforced limitation of production schedules, and the possibility of making a better market impression by increasing attractive features. This trend alone would invoke lower schedules, though a large market should develop in the fall. There are only two factories which are distinctly set against the so-called de luxe models, Ford and Hudson. In the case of Ford and Hudson, each claims a distinct sales asset which does not require resorting to special trimmings as marketing aids. In Ford's case this is price. In Hudson's it is its low-price inclosed models.

Executives who have been visiting in various parts of the country are generally optimistic over the general prospects for fall business. The worst part of the year has been experienced in most localities, they assert, and from now on conditions will get generally better. Dealers have practically no new cars on hand except those actually needed for display and demonstration. There are still a large number of used cars and used car business is slowed down to the extent of requiring unusual marketing efforts, but it is expected that these will accelerate just as rapidly as new car business develops.

The Week in the Industry

General Motors Corp. has issued its half-year financial report, which shows a decrease in earnings of about 35 per cent as compared with January to July last year, and has announced the formation, in alliance with the Standard Oil Co. of N. J., of the Ethyl Gasoline Corp. to take over the sale of ethyl gas. The decrease in profits was to be expected as a result of the business slump which has gripped industry for the last six months. It is interesting to note that in the same six-month period Hudson-Essex built more vehicles than during the whole of 1923.

Business conditions in the industry in general have assumed a firmer tone than at any time since last year.

Price increases continue to come through, Auburn and Jewett being the newcomers this week. Announcement of new models accompanied the increase in the latter instance. The Price-Increase Club seems likely to continue its gain in membership for the next few months.

German automobile manufacturers gave a dinner in honor of Alfred Reeves and told him some straight facts about the German automotive industry which added to the store of practical information the N.A.C.C. general manager is collecting for the benefit of American manufacturers.

Akron reports another big production boom. Some conservative students of the tire business are inclined to think it won't last long. At any rate they are building a lot of tires right now.

The Coliseum promises to be a greatly improved showplace when time for the Chicago exhibit arrives next winter. Radical changes are being made and particular attention is being given to improving display possibilities for parts and accessories makers.

Chicago Zone Finds Increasing Activity

August Car Production Expected to Be Somewhat Higher Than Month of July

CHICAGO — Activity of automotive manufacture in this district continues along its conservative course with the production curve being directed somewhat upward in certain divisions of the industry, especially in automobile making, and with most of the allied schedules being held to safe proportions. The outlook in automobile production at this time is substantially what it was when the month was entered upon, the expectation being that output figures in the main for this stage will be measurably higher than those of July, but not greatly exceeding the record of that month.

Dealer capacity and retail prospects still rule as the guide for factory programs and this promises to be the case for an indefinite period. There is no inclination on the part of automobile manufacturers to do any speculative campaigning. For the present they are more concerned with meeting the immediate demand of the consuming market and overhead expenses are being closely watched.

Retailers in Better Shape

Retail agencies are in much better shape than a month back with respect to stocks and there have been encouraging reports of increased takings by dealer establishments in response to improvement in local demand. In the matter of consumption it cannot be said that there has been a general improvement in this marketing zone, community prosperity being the important consideration.

It is noticed that in some of the mining and other industrial localities where unemployment is above the average that consumption has been particularly low, while renewed buying interest in other sections no doubt reflects the bettered financial condition of farmers and other rural factors. Consumption, however, is on the upgrade and no doubt this tendency will continue, the factories stepping up production accordingly.

According to registration tabulations for July nine companies of this general territory made a showing in Illinois amounting to something under 300 per cent over June. While a part of the July registration was held over from June for the advantage of the half year license rate the great increase for these companies, at least, indicates a strengthening of consumption during July in Illinois and suggests that demand in this territory has taken a positive movement upward.

Dull Second Quarter Cut G. M.'s Earnings

Profits for the First Three Months Were Nearly Equal to Those of Last Year

NEW YORK, Aug. 18—In the first half of the present year net earnings, after taxes, totaled $27,066,990, in comparison with $41,585,601 in the corresponding period of 1923, General Motors Corp. reports. With the first quarter netting $19,400,957, as compared with $19,406,123 in the first three months of 1923, it looked as if 1924 would be another banner season. The decline of the second quarter from $22,179,478 in the corresponding period last year to $7,666,033 brought about the drop in earnings for the six months.

The condensed consolidated income account shows net sales of $314,426,673 in the first half, as against $362,819,353 in the corresponding period last year, representing retail deliveries by dealers of 379,590 units and General Motors sales to dealers of 353,099. This compares with 408,985 and 397,181 last year.

Profits Netted from Operatives

Net profits from operations and investments for the first half totaled $33,311,135, as against $51,106,139.

As a result of operations in the first half General Motors shows a surplus available for dividends of $27,066,990. The regular quarterly dividends on the debenture and preferred stocks, requiring $3,462,160, were paid, after which there remained for the common stock $23,604,830, or the equivalent of $1.14 per share on the 20,646,337 shares outstanding. Two quarterly dividends, each of 30 cents a share on the common stock, were paid, totaling $12,386,164, leaving a balance of $11,218,666 carried to surplus account from earnings.

If the corporations' statement of earnings reflected the earnings of Fisher Body and General Motors Acceptance Corp. outside of the dividends received, the amount earned on General Motors common for the first half would be $28,600,701, equivalent to $1.39 a share and comparable with $2.18 last year.

Conservative Production Policy

In explanation of the drop, the corporation states:

The corporation's policy of manufacturing cars during the winter months in quantities to meet the contemplated spring demand was followed during the past winter, but due to the general business recession which developed, the sale of cars by dealers and distributors to consumers this spring was below the estimated demand so that production was curtailed during the second quarter in order that stocks of cars on hand, including cars in the hands of dealers and distributors, could be more quickly reduced to normal; this accounts for the sharp reduction in earnings for the second quarter as compared with the first quarter of this year.

While substantial progress has been made in reducing stocks, curtailed production is being continued during the third quarter in an effort to establish permanently healthy and sound conditions in the industry and particularly among dealers and distributors; the extent of this curtailment will necessarily depend on the demand for and sale of cars to consumers, which no doubt will be governed by general business conditions existing during this period.

Net earnings available for common stock dividends for the first six months show $23,604,830, or within $1,170,774 of the $24,775,604 required for the full year's dividend on the common stock.

Quarterly sales of cars and trucks, and profits follow:

1924	First Quarter	Second Quarter	First Six Months
Retail deliveries	139,148	240,442	379,590
Sales to dealers	215,550	137,549	353,099
Net earnings (after taxes)	$19,400,957	$7,666,033	$27,066,990
Earned on common st'k	17,669,887	5,934,943	23,604,830
1923			
Retail deliveries	146,049	262,936	408,985
Sales to dealers	176,258	220,923	397,181
Net earnings (after taxes)	$19,406,123	$22,179,478	$41,585,601
Earned on common st'k	17,704,199	20,475,305	38,179,504

(*Continued on page* 386)

BRITISH CARS TO PAY LOWER DUTY TO U. S.

WASHINGTON, Aug. 18—Acting under the reciprocity clause which permits the President to reduce import duties when another country shows consideration to the United States along these lines, the Government has cut from 33 1/3 to 25 per cent the duty on motor cars and parts imported from Great Britain.

This ruling is effective Aug. 1 and follows the abolition of the McKenna duties by Great Britain as of the same date.

Stephens Alters Charter Prior to Plant Sale

MOLINE, ILL., Aug. 20—The Stephens Motor Car Co. of Freeport, Ill., has certified to the Secretary of State to a change of its name from the motor car company to the Moline Implement Co. and the change of its address from Freeport to Moline, where the central Moline Plow Co. factory is located.

Capital stock of 20,000 shares of $100 par was altered to 40,000 shares of no par. L. S. Shonts, secretary, explained that this is simply a transfer of its activities to the Moline Plow and clears the way for the sale of the property. Manufacture of the Stephens cars was suspended some time ago, although arrangements have been made to continue service parts supply.

Agreement Reached for British Dunlop

Preferred Dividend Arrears to Be Paid in Cash, Necessitating New Financing

LONDON, Aug. 11 (*by mail*)—After negotiations extending over six weeks, agreement has been reached by the directors of the Dunlop Rubber Co. with the various classes of stockholders concerning the proposed reorganization of capital and arrears of dividends of the preferred stock. The reorganization has been rendered necessary by the need for writing off the debit balance of approximately £12,000,000 arising from the trading and other losses during the "slump" period.

The negotiations had reference mainly to the objection of the preferred stockholders to the funding of their dividend arrears by the issue to them of new common stock. It has now been arranged that the arrears will be paid in cash, that the "C" preferred stock is to be reduced in value from 20s to 16s, with the dividend increased from 8 to 10 per cent, and that the common stock is to be reduced in value from 20s to 6s 8d (i. e., by two-thirds). Paying the arrears of preferred dividend in cash will doubtless involve some new financing, and it is expected that an issue of second debentures will be made.

In view of the capital reorganization thus arranged, and also on account of the excellent progress the company has made under its present management, resulting in increased sales and economies in working, it is expected that the directors will be in a position to recommend a small dividend on the reduced common stock for the current year.

German Industry Tenders Dinner to Alfred Reeves

NEW YORK, Aug. 20—Alfred Reeves, general manager of the National Automobile Chamber of Commerce, who is investigating automotive conditions in Europe, was tendered a dinner in Germany by the manufacturers' organization, the Reichsverband der Automobilindustrie, and the dealers' association, the Deutscher-Automobil-Handler-Verband, N. A. C. C. headquarters here is advised.

At this dinner need for more motor transportation in Germany was emphasized, and Mr. Reeves was informed that at the present time Germany has only one motor vehicle to every 400 persons, in comparison with the ratio of 1 to 7 in the United States. There are only 60 motor vehicle manufacturers and 1900 dealers, and at present cars can be imported only under permit, except in the occupied territory, which is open. The Germans, Mr. Reeves was told, are preparing for their big show which opens Sept. 26.

G.M.C. and Standard Form Ethyl Company

General Motors Chemical Co. Is Succeeded by New $5,000,000 Corporation

NEW YORK, Aug. 18—An alliance between the Standard Oil Co. of New Jersey and General Motors has been formed through the organization of the Ethyl Gasoline Corp., a $5,000,000 concern in which both are equal stockholders. The new company will take over the sale of ethyl fluid which in the past has been handled by the General Motors Chemical Co., and will continue the marketing policies of that company.

The distribution of ethyl fluid will not in any way be confined to the Standard Oil Co. of New Jersey, or to any other single company or group of companies, it is announced. The policy and purpose will be to furnish it generally on equal terms to all responsible gasoline marketing organizations, subject only to the limited exclusive contracts originally made by the General Motors Chemical Co. for the purpose of introducing the new product to the trade.

The new corporation will take over the present business of the General Motors Chemical Co. and will undertake immediately to increase the production and enlarge the distribution of ethyl fluid.

Both Standard Oil of New Jersey and General Motors are equally represented on the board of directors, which includes Alfred P. Sloan, Jr., Charles F. Kettering, Donaldson Brown, Thomas Midgley, Jr., and John Thomas Smith of General Motors, and W. C. Teagle, J. A. Moffett, Jr., E. M. Clark, F. A. Howard and A. M. Maxwell of the Standard Oil Co. of New Jersey.

Officers are: Charles F. Kettering, president; F. A. Howard, first vice-president; Thomas Midgley, Jr., second vice-president and general manager; A. M. Maxwell, third vice-president and sales manager; Donaldson Brown, secretary and treasurer; Chester O. Swain, general counsel.

Offices of the corporation are in the Cunard Building, 25 Broadway, New York City.

Action Against Falls Is to Protect Assets

MILWAUKEE, Aug. 18—The application of the First Wisconsin Trust Co. of Milwaukee to the Federal Court for a receiver to handle the affairs of the Falls Motors Corp., manufacturer of Falls automobile engines, is made to conserve the property, according to George N. Luhman, trust officer of the applicant.

The petition recites that the Falls company is a Virginia corporation licensed in Wisconsin, with principal offices at Richmond, Va., and plants in Sheboygan Falls and Sheboygan, Wis. It gave the First Wisconsin a trust deed to secure a bond issue of $500,000, and the initial interest payment, amounting to $15,000, became due on July 1, last. Under the deed the First Wisconsin holds certain voting rights upon default of any covenant in the mortgage. Demand was made Aug. 7, it is stated, for the interest due July 1, and the principal as well, but it is claimed that no reply was made to the demand.

The claim is made that the Falls company failed to pay taxes of $12,612 upon its property in Sheboygan County, as the result of which default a tax lien has been issued by that county. It is requested that an order be issued for the sale of the property at the expiration of one year unless the bonds are redeemed in full prior to that limit.

The Marshall-Huschart Machinery Co., Chicago, and the Jefferson Forge Products Co., Detroit, are made co-defendants, inasmuch as they are said to be large creditors, and the action is taken to restrain them from attempting to collect debts due under alleged liens.

M. A. M. A. DEPARTMENT ISSUES "SHOW NEWS"

NEW YORK, Aug. 18—The show department of the Motor and Accessory Manufacturers Association has launched Show News, a publication designed to keep members informed regarding plans for the 1925 national shows at New York and Chicago.

It will be issued frequently and will confine itself entirely to news of the shows, in which the association participates in the management and assignment of space.

Briggs & Stratton Buys Toledo Equipment Maker

TOLEDO, Aug. 20—The Toledo Automotive Products Co. has been sold to the Briggs & Stratton Co. of Milwaukee, according to announcement by A. R. Clas, vice-president of the Toledo company.

The local company has been in business for about four years, and has made a line of body hardware, window regulators, switches, horns and other equipment. All of its patents and rights have been taken over by the Milwaukee company and the plant equipment will be moved to that city. A portion of the equipment may be sold.

For some time Briggs & Stratton has been manufacturing window regulators under a license from the Toledo concern and it is said the business volume grew to such an extent that offers were made to take over the whole company.

R. W. Randall, factory manager here, will go with Briggs & Stratton in a similar capacity.

Mr. Clas will take a trip abroad, spending about nine months in Europe. When he returns he plans to go back to his old profession of architecture and probably locate in Milwaukee.

C. G. to Concentrate in 2 Main Factories

Spring Company to Effect Economies Through Consolidating Main Activities

DETROIT, Aug. 16—In a letter to stockholders this week Christian Girl, president of the C. G. Spring & Bumper Co., reports that the major manufacturing activities of the company will be consolidated in two main plants in Detroit and Chicago. The changes as proposed will result in enlarged capacity, he declares, concentration of effort and a saving of $75,000 to $100,000 annually through freight reduction and decreased overhead.

Following a fire at the original Kalamazoo plant in March, 1923, the company leased several properties to permit an immediate resumption of operations. These were at Kalamazoo, Chelsea, Mich., and Cleveland, where the plant of the Cooper Spring Co. was taken over. Temporary arrangements were also made necessary in Chicago owing to a fire in the plant there.

With the taking over of a large factory building in Chicago and the erection of an addition to it, now almost completed, the company will cease operations in Kalamazoo, making Chicago the site of manufacturing formerly carried on there. Steel used in the Kalamazoo plant was bought in Chicago and, after manufacturing, was sold in large part in Chicago and shipped through that city to the great central district. This freight excess will be eliminated.

Detroit facilities have been enlarged and will be increased further to obtain sale and delivery advantages in dealing with car manufacturers. Equipment from the Kalamazoo, Chelsea and Cleveland plants will be set up in the new buildings in Chicago and Detroit, except for the maintenance of a smaller plant in Cleveland from which sales in that territory will be handled.

Lighter Weight Wheel Is Produced by Hayes

JACKSON, MICH., Aug. 19—By the elimination of the felloe, important reductions in weight, particularly at the outer circumference, have been effected in a new disk wheel which has been brought out by the Hayes Wheel Co. The new wheel is designed for use with the standard Hayes rim with attached lugs and takes rims of either 3½ or 4½ in. width.

All sizes of this disk wheel may be mounted on the same hub flange as the design at this point is standardized. Another advantage of this wheel is that the demountable rim construction makes it unnecessary to carry five complete wheels. The rims used are interchangeable on wood and wire wheels of corresponding size.

Convention Keynote Chosen by M.A.M.A.

Will Be "Getting Ready for Better Business"—Program for Meeting Outlined

NEW YORK, Aug. 21—"Getting Ready for Better Business" will be the keynote of the fall convention of the Motor and Accessory Manufacturers Association, which will be held at the Hollenden Hotel in Cleveland Oct. 15-17.

This was decided upon at the first meeting of the convention committee, held here yesterday and presided over by Chairman E. P. Chalfant of the Gill Manufacturing Co. At the same time the personnel of the committee was announced. It includes M. H. Tisne, A. Schrader's & Sons Co.; J. F. Kelly, Electric Storage Battery Co.; A. H. Grayburn, Norma-Hoffmann Bearing Corp.; B. M. Asch, Asch & Co.; J. Lorentz, Laidlaw Co., and Frank White, Stewart-Warner Speedometer Corp.

The first day's session of the convention will be devoted to the business outlook, with a prominent international financial authority as one of the main speakers. In addition there will be a summary of the automotive outlook by presidents of several of the leading automotive associations.

Merchandising will be the theme the second day, with discussions on the jobber, specialty distributors and dealers, while foreign trade also will be on the card prominently. On the third day there will be a credit session on manufacturers' credit as well as jobbers' and dealers'.

Hoover Steel Ball Co. Buys Imperial Bearing

DETROIT, Aug. 20—The plant and equipment of the Imperial Bearing Co. of this city has been bought by the Hoover Steel Ball Co. of Ann Arbor for a price said to be in excess of $500,000. The plant will be entirely discontinued, all equipment being removed to Ann Arbor, in which city the Hoover company will supplement its former exclusive ball bearing product with a complete bearing line.

H. D. Runciman, general manager of the Hoover company, said the purchase would give Hoover an established complete line of bearings. The company has felt the need of expanding its product for some time, he declared.

The Imperial company was owned by F. Earl Long and manufactured thrust and annular bearings. It has been established for a number of years and had a large production rate. The Hoover company for years has been a leading manufacturer of ball bearings.

S. A. Strickland, who has been manager of the Imperial, will become manager of the bearing department of the Hoover company. He has been elected to the directorate, succeeding R. T. Dobson, resigned.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Aug. 20—Further gains in wholesale and retail trade, especially in the West, were reported last week. Favorable crop reports, firm commodity prices and some increases in basic industrial operations have tended to stimulate confidence. Private agencies forecast a larger cotton crop than has been indicated by official estimates.

Car loadings reached the year's highest point in the week ended Aug. 2, numbering 945,731, as against 925,859 in the preceding week and 1,033,466 in the corresponding period last year. Freight traffic during the first half of this year amounted to 204,636,000,000 net ton miles, marking a decrease of 9 per cent from the corresponding total a year ago.

The consumption of cotton by domestic mills in July was 346,671 bales, comparing with 350,277 in June and 462,654 in July, 1923. The total for last month is the smallest since December, 1920.

Building contracts awarded in July in 36 eastern States, as reported by the F. W. Dodge Corporation, represented a total value of $347,184,300, which is 10 per cent less than the total for June, but 10 per cent greater than that for July, 1923.

Preliminary figures of foreign trade for July show exports of $278,000,000 and imports of $278,400,000. The export total is the lowest recorded since February, 1922, and imports are also exceptionally low. The indicated excess of imports compares with an export surplus of $30,000,000 in June and $14,752,000 in July of last year.

Fisher's index of wholesale commodity prices stood at 148.5 last week, having nearly regained the level of two weeks before, which was 148.7. Bradstreet's food index last week was $3.23, comparing with $3.22 in the preceding week and $3.17 a year ago.

Discounts by Federal Reserve banks declined $7,400,000 during the week ended Aug. 13, despite a small increase in bills secured by Government obligations.

Fifth Avenue Coach Would Triple Buses

Proposes to Put on 900 in New York City, Covering 116 Additional Miles

NEW YORK, Aug. 20—Operation of approximately 900 buses on the streets of Greater New York as against 300 now, by the Fifth Avenue Coach Co., will follow if the Board of Estimate grants the application of this subsidiary of the Omnibus Corp. of America for long time franchises giving it 116 miles of additional lines in Manhattan, the Bronx and Queens. It is proposed to install 34 new routes, which necessarily will bring the Fifth Avenue Coach Co. into active competition with the Interborough Rapid Transit Co.

This move is the first step taken by John Hertz, head of the Omnibus corporation, to carry out the aims of the organization, which seeks to install model motor transportation service in the larger cities of the United States. It comes in the nature of a surprise to the city authorities, but favorable action is anticipated, because it is regarded as offering much needed transit relief to New York under terms which spell profit to the city. Provision is made for the city to receive 2 per cent of the gross earnings, and the lines will be recapturable.

Some Competing Lines

Of the 34 new routes asked for, some will come into competition with municipally operated bus lines, which fact might, it is thought, produce some opposition to the plan. The Omnibus corporation, however, believes that transit relief depends upon service controlled by one operating company. On some of the new lines proposed 10 cent fares will be collected, while on others, crosstown lines, the 5 cent rate would prevail.

Preceding the filing of this application there came the breaking off in relations between officials of the Fifth Avenue Coach Co. and the Interborough Rapid Transit Co., brought about by resignations from the two boards of directors, who were on both. As a result there now are no Interborough men on the Fifth Avenue Coach Co. board and vice versa. Through the change, John A. Ritchie, who in addition to being president of the Omnibus corporation is also president of the Chicago Motor Coach Co., will head the Fifth Avenue company.

NO PRODUCTION SHOW

DETROIT, Aug. 21—No show will be held by the Society of Automotive Engineers in connection with its production meeting, Oct. 21-24, it was voted yesterday at a meeting of the Detroit section. Engineers attending the meeting will have the opportunity of visiting plants in the city and observing machines in operation, thus making the holding of a special exhibition unnecessary.

Men of the Industry and What They Are Doing

Herbert R. Hyman Resigns

Herbert R. Hyman has resigned as sales and advertising manager of the Stutz Motor Car Co. of America, a post he has filled for the last two years. His future plans will not be announced until his return from a vacation he is enjoying in Canada. President W. N. Thompson has assumed personal charge of Stutz sales, assisted by E. T. Klee, recently appointed assistant to the president after several years as a Stutz executive.

Nash Hunting Big Game

Charles W. Nash, president of the Nash Motors Co., has gone on a two months' vacation trip in British Columbia. He is accompanied by James Clemens of the L. C. Chase Co., Boston, and William J. Bodwell, overseer of the Sanford Mills, Sanford, Me. The object of the trip is big game hunting in the wilds of the Pacific Northwest.

A. W. Barber Resigns

Alexander W. Barber, for several years secretary and later trade observer for the Motor and Accessory Manufacturers Association, has resigned from that organization. During his connection with the M. A. M. A., Mr. Barber made a wide acquaintance among manufacturers, jobbers and dealers of the country and became familiar with merchandising and credit problems. He has not announced his plans for the future.

Meese General Sales Manager

Horace S. Meese, who has had charge of the transportation engineering and export departments of the Commercial Truck Co., has been made general sales manager, continuing, in addition to his new duties, to have charge of all three departments mentioned. As chairman of the transportation engineering committee of the Commercial Section of the National Electric Association, Mr. Meese is well known in the industry.

Overland Promotes Calkins

W. B. Calkins, for four years assistant purchasing agent of the Willys-Overland Co., has been made general purchasing agent. He succeeds W. P. Cromling, who died recently. Mr. Calkins has been in the automobile business for more than 20 years.

M. M. Sweet in Expot Business

Miss Marjorie M. Sweet has resigned from the foreign sales promotion department of *El Automovil Americano* and the *American Automobile* (Overseas Edition), both published by the Class Journal Co., to enter the automotive export business as a partner of Anton P. Kwast, representing the Pacific Rim Tool Co. and the All-Clear Windshield, Inc., abroad. Offices have been opened at 259 Broadway, New York City, and the new concern will specialize on automotive products. Miss Sweet is a sister of William M. Sweet, president and general manager of the Klaxon Co.

Baumgartner Succeeds Kraus

Walter J. Baumgartner, for the last two years chief engineer of the Garford Motor Truck Co., has assumed the duties of John Kraus, advisory engineer, who recently resigned from the Garford service.

Union Pacific Elects Seger

C. B. Seger, chairman of the board of the United States Rubber Co., has been elected chairman of the finance committee of the Union Pacific Railroad, following the resignation of Charles Peabody.

Martin Appointed Chairman

B. J. Martin of the Commonwealth Edison Co. of Chicago has been appointed chairman of the transportation bureau, commercial national section of the National Electric Light Association, succeeding Charles R. Skinner, Jr., of the New York Edison Co.

James Goes with Oil Company

W. S. James, who left the Bureau of Standards several months ago to become associated with the Hupp Motor Car Co., has resigned from the latter organization to join the Associated Oil Co. of San Francisco.

Hambly Sails for Europe

Frank L. Hambly has sailed for Europe, where he will represent the Nordyke & Marmon Co. in establishing foreign dealer connections. His itinerary includes England, Belgium, Holland, Denmark, Sweden, Finland, Poland, Germany, Czecho-Slovakia, Austria, Switzerland, France, Italy, Greece, Spain and Portugal. His tour will last three months.

Lexington Adds Models and Increases Prices

CONNERSVILLE, IND., Aug. 20—An advance in prices ranging from $30 to $70 on the "Concord" model and from $85 to $150 on the "Minute Man" models have been announced by the Lexington Motor Co., effective immediately.

On the "Concord" chassis two new models have been added, a 5-passenger closed phaeton and a special sport phaeton, listing at $1,595 and $1,695 respectively.

On the "Minute Man" chassis a new 5-passenger sedan with two additional "taxi" seats listing at $2,830 has been added to the line.

Balloon tires are now standard equipment on all models on both chassis.

The following table shows the old and new prices:

CONCORD	Old price	New price
5-pass. phaeton	$1,465	$1,495
5-pass. phaeton (inclosed)	New	1,595
5-pass. special phaeton	New	1,695
5-pass. sedan	1,915	2,085
MINUTE MAN		
2-pass. roadster	$1,895	2,045
5-pass. phaeton	1,895	1,995
5-pass. Lark phaeton	2,145	2,230
5-pass. Cal. phaeton	2,195	2,295
7-pass. phaeton	1,995	2,095
7-pass. Cal. phaeton	2,295	2,395
5-pass. Royal Coach	2,295	2,430
5-pass. brougham	2,395	2,530
5-pass. sedan	New	2,830

Price Advance of $100 Made on Auburn Models

AUBURN, IND., Aug. 19—An advance of $100 in the list prices of both the "6-63" and "6-43" models has been announced by the Auburn Automobile Co.

On the "6-63" chassis balloon tires and four-wheel brakes may be supplied as optional equipment at an additional cost of $60 and $65 respectively. With the exception of the English coach, which has balloon tires as standard equipment, all models on the "6-43" may be equipped with balloons for $50 extra.

The old and new prices follow:

Model "6-43"	Old Price	New Price
5-pass. Special phaeton	$1,295	$1,395
5-pass. Sport phaeton	1,365	1,465
5-pass. Touring coupe	1,595	1,695
5-pass. English coach	1,845	1,945
5-pass. Sedan	1,695	1,795
Model "6-63"		
5-pass. Phaeton	$1,695	$1,795
5-pass. Sport phaeton	1,935	2,035
5-pass. Sedan	2,445	2,545
5-pass. Brougham	2,245	2,345
7-pass. Sedan	....	2,545

TRACTOR PRICES HIGHER

QUINCY, ILL., Aug. 18—The Electric Wheel Co., manufacturer of the Allwork tractors, announces an increase in price of $100 on its models "C" (16-30) and "D" (20-35). They list now at $1,395 and $1,795 respectively.

BIGGER CONTINENTAL OUTPUT

DETROIT, Aug. 20—The productions schedule of Continental Motors Corp. for September has been increased over the August schedule, the company reports, due to increased activity by car makers and a sustaining large volume of truck production. August shipments from the Detroit plant will be within 10 per cent of the highest peak month, it is declared.

Detroit Machine Tool and Norton Co. Unite

H. W. Holmes Continues Head of Former Company—Norton Executives Go on Board

WORCESTER, MASS., Aug. 18—A consolidation has been effected bringing together the Detroit Machine Tool Co. of Detroit and the Norton Co. of this city, the latter one of the largest manufacturers of grinding wheels and grinding machines in the world, and the former producing a centerless grinding machine and controlling a new method of grinding which is said to reduce costs without sacrifice of quality and making it possible for unskilled operators to turn out accurate work.

No change in the business policy of the Detroit company is to be made. Harold W. Holmes will continue as president and general manager and the Detroit plant will continue in operation.

As a result of the deal four of the Norton executives have been added to the board of directors of the Detroit company —Vice-President Clifford S. Anderson, Treasurer Henry Duckworth, William La Coste Neilson and Aldus C. Higgins.

Farmers Discouraging Railway-Truck Service

DETROIT, Aug. 20—Fear that the operation of a combination electric railway and truck freight service in the Thumb district of this State might decrease railroad freight business and lead to a discontinuance of train service has caused the board of directors of the Marlette Farmers Cooperative Elevator Co. to pass resolutions discouraging the establishment of the rail-truck service.

In the resolutions the farmers' organization asserts that the rail-truck service at best would be able to continue operations only part of the year, leaving the farmers without adequate service during the winter months. It is also declared that the operation of trucks would cause additional wear to the highways.

This action was taken by the organization following reports that the Detroit United Lines would extend the rail-truck freight service which it has already established in several parts of the State to the Thumb district. This petition is now before the State utilities commission and has the backing of prominent shipping interests in Detroit and other cities along the proposed route.

END USED CAR LABORATORIES

CHICAGO, Aug. 18.—The Automotive Testing Laboratories, launched April 1 as a division of the Chicago Automobile Trade Association, has been discontinued. The laboratory was established for the purpose of testing, approving and tagging used cars. "While it had great merit and could have been used to advantage by the members in the sale of used cars, there seems to be a lack of interest and support in the proposition which justified its discontinuance," the formal announcement of the association states.

MORE FOREIGN CARS TO SHOW AT OLYMPIA

LONDON, Aug. 12 (*by mail*)—The preliminary list of exhibitors at the 1924 Motor Exhibition, to be held at Olympia Oct. 16-25, shows that 129 firms will have models on view in the automobile section. All but 22 of the British firms will be exhibiting, the principal exceptions being Angus-Sanderson, Guy, Morgan and Ruston-Hornsby.

North America will be represented by 20 makes, France by 27, Italy by 10 and Belgium by 3. The high proportion of foreign exhibits is mainly due to the annulment of the import duties.

Deal Pending to Locate Roamer Plant in Canada

KALAMAZOO, MICH., Aug. 20—A. C. Barley, president of the Roamer Motor Car Co. of this city, will not confirm reports that Canadian capital has secured control of the Roamer company with the idea of building the Roamer in the Dominion and also operate the local plant, making the Barley Six and taxicabs. Mr. Barley, however, admits that such a deal is pending, but adds that he cannot give details at the present time. It is said that if the Canadian plan goes through Mr. Barley will continue as president and general manager.

Canadian advices declare that efforts are being made in Toronto to float a 7 per cent issue for $500,000 to obtain working capital, following the reported purchase of the physical assets of the Kalamazoo company for $350,000 and the acquiring of a Toronto plant containing 85,000 sq. ft. of floor space. The capital of the new company will be $500,000 7 per cent preferred stock and $500,000 common, it is reported.

The local plant has been practically idle for months, the only employees being a few retained in the office and service department. A plan to unite the Roamer and the Premier Motor Car Co. was suggested and seriously considered, it is said, but nothing came of it.

Willys-Overland Ships 100,000th Car Overseas

TOLEDO, Aug. 19—An event of considerable importance in the history of the Willys-Overland Co. took place when the 100,000th car to go into export trade was dispatched from the factory by way of New York to Sydney, Australia.

The car was a Willys-Knight country club model.

Vessels Can Utilize Trucks in Shipments

But Interstate Commerce Commission Says Charges of Latter Must Be Separate

WASHINGTON, Aug. 19—The Interstate Commerce Commission has ruled that carriers subject to the Interstate Commerce Act may utilize motor trucks in interstate transportation under certain conditions.

Under the ruling the Starin-New Haven Line, a carrier by water operating between New Haven, Conn., and New York, N. Y., will be permitted to continue its practice of moving shipments from interior Connecticut points to New Haven by motor truck and for trans-shipment thence to New York and beyond.

The commission disclaimed jurisdiction over traffic moving by motor truck except when such service is performed at terminals or in connection with transfer of freight in transit.

However, the commission held, the joint rates of the Starin-New Haven and the Clyde lines and their southern rail connections to interior points in southern territory were under its jurisdiction, and the question involved was whether the service in connection with such joint rates could be lawfully extended to the New England interior points where traffic is picked up for Starin-New Haven.

Interchanging Permitted

In its finding the commission declared the law does not prohibit either a rail or water carrier subject to the Interstate Commerce Act from interchanging with motor trucks and entering into proper arrangements to acquaint the shipping public with the total charges for the through movements. Tariffs of the Starin-New Haven, the commission declared, should show separately the charges for the motor truck service.

The commission further said that publication by the Starin-New Haven of proportional rates from New Haven lower than the local rates and applicable on traffic originating at the interior points will be lawful, provided that the application of the rates is not confined to traffic moved to New Haven by truck.

Commissioner Aitchison, supported by Chairman Hall and Commissioner Cox, declared that until some regulation of interstate transportation by motor trucks was attained, the maintenance of proportional rates, such as were authorized by the commission on traffic interchanged with motor trucks, was unlawful.

MAXWELL TRUCK DROPPED

DETROIT, Aug. 18—The discontinuance of the Maxwell 1½-ton truck has been announced by the Maxwell Motor Sales Corp. With the elimination of this model the Maxwell corporation will concentrate solely on the Chrysler and Maxwell passenger cars.

Warehouse Receipts Will Be Simplified

Conference of Shippers Called by Department of Commerce for Sept. 24

WASHINGTON, Aug. 20—The National Automobile Chamber of Commerce, the Motor and Accessory Manufacturers' Association, the National Automobile Dealers Association and other automotive groups are among 500 trade organizations which are being invited by the Department of Commerce to send representatives to a national conference of shippers which route their products through public merchandise warehouses, to be held at the Department of Commerce Building on Sept. 24. Automobile and truck manufacturers, distributors and dealers who are known to be using public warehouses for distribution are receiving individual bids to attend.

Aim Is to Eliminate Waste

The purpose of the conference, which will be addressed by Secretary of Commerce Hoover, will be elimination of waste through simplification of certain forms which the public merchandise warehouse industry uses in its business dealings with customers.

One of these forms is the negotiable warehouse receipt. Literally hundreds of varieties of the negotiable warehouse receipt are in use throughout the country today, appearing in a multitude of sizes and colors, and bearing varying texts, some of which do not conform with the Uniform Warehouse Receipts Act, which is in effect in virtually all of the States. Inasmuch as the negotiable warehouse receipt is acceptable by the banks for loans, its importance to storers in warehouses is obvious.

Hundreds of thousands of automobiles and motor trucks are stored annually in public warehouses by manufacturers, distributors and dealers, and the receipts therefor used to secure loans at banks. The proposed standard receipt not only is protected by the Uniform Warehouse Receipts Act, but has been indorsed by the American Bankers Association. The Department of Commerce is expected to approve the document officially.

Some Forms Simplified

Several of the other forms which have been simplified and which will be considered at the Washington conference are documents generally in use by warehousemen when storing automobiles and motor trucks. These include the stock report which the warehouseman sends to the storer. "The variety of forms of stock report now in use," the simplification commission of the American Warehousemen's Association says in its report to Mr. Hoover, "exceed in the aggregate the total number of warehousemen using stock reports." Virtually no two warehousemen in the past, in their dealings with storers of automotive products, have used stock reports which are alike.

R. M. Hudson, chief of the Division of Simplified Practice of the Department of Commerce, in his invitation to storers to attend the conference, says:

"The simplification and standardization of the forms most commonly used in warehousing will help greatly to reduce unnecessary expense and avoidable waste in distribution and bring greater economies to shippers and manufacturers, as well as warehousemen."

The various groups represented at the Washington conference will be requested by the Department of Commerce to accept the documents simplified by the American Warehousemen's Association. Subsequently the Government will distribute acceptance blanks to storers, warehousemen and others. After favorable returns have been received from these groups, the Department of Commerce will place its official indorsement on the forms, and manufacturers and warehousemen will be expected to place them universally in use for a limited experimental period, probably throughout 1925, at the termination of which another conference may be held.

$1,525 Deluxe Brougham Is Added to Jewett Line

DETROIT, Aug. 20—The Jewett line for the coming year as announced by the Paige-Detroit Motor Car Co. will include four standard and three deluxe models, the latter including a new brougham. No changes have been made in the chassis, but balloon tires, 32 by 4.95, are made standard equipment on all models and the company is offering new colors and color combinations in the various styles. The new prices as compared with the old follow:

	Old Price	New Price
Touring car	$1,065	$1,135
3-pass. coupe	1,250	1,310
5-pass. brougham	1,325	1,385
5-pass. sedan	1,495	1,545
Deluxe touring car	1,220	1,290
5-pass. deluxe brougham	....	1,525
5-pass. deluxe sedan	1,695	1,745

The touring car, coupe and sedan of the standard line are furnished in autumn green satin finish. The high lustre baked on black enamel finish is continued on the standard brougham. The touring car of the deluxe line is finished in lotus blue, and sedan in lotus and hathor blue, and the brougham in autumn green satin finish. Carriage irons and leathered back are introduced in the deluxe brougham.

Equipment of the deluxe models includes spare tire, tube and tire cover, trunk and rack, combination stop and tail light, spring bar bumpers, motometer, cowl lights, windshield wiper, rear view mirror, sun visor and spotlight. Heaters are provided in the brougham and sedan models.

The company has adopted the slogan "One Billion Mile" Jewetts, based upon the mileage that the 100,000 Jewetts now in owners' hands have given.

California Statutes Need to Be Clarified

Transportation Laws Complicated and Remedy Will Be Asked of the Legislature

LOS ANGELES, Aug. 20—The transportation laws of California have become so complicated in their application to motor vehicles that legal proceedings have been instituted in efforts to clarify the situation. The law provides for a tax of 4 per cent on the gross revenue of all "for hire" motor vehicles that do not operate exclusively within the limits of a municipality. It is being applied alike to those operators who function under a certificate of public convenience and necessity, issued by the railroad commission, and those who do contract hauling only.

The State's transportation act has come in for severe denunciation, and at the next session of the Legislature an attempt will be made to repeal it or amend it in many details. The commission classifies operators of freight and passenger transportation lines having a State certificate as public utilities.

These lines are made to comply with all the laws governing the conduct of other public utilities, but it is claimed they are not accorded the protection against competition that they are entitled to. The commission's answer to this is that it does not have sufficient employees and revenue for proper enforcement.

The commission also has authority over those operators who are known as "contract haulers," and it is alleged that they are without proper authority to interfere with contractual relations. Under the statutes decisions of the commission are not subject to court review.

Ford Now Die Casting Aluminum on Big Scale

DETROIT, Aug. 18—Ford Motor Co. is now die casting aluminum on a large scale at the Highland Park foundries. Among the principal parts cast in this department are fan-belt pulleys, on which there is a daily production of 10,500; magnet supports at the rate of 140,000 daily, 4500 sedan moldings, 7400 window regulators and 8000 priming rods.

Under the Ford method of die casting aluminum, the die is placed directly above the pot containing the molten metal, this being forced under air pressure through a feeder into the die and on up to the top of the latter. As the metal goes in, the air is forced out through minute vents provided for the purpose.

The cast solidifies from the top downward. The air is forced out by the first rush of molten metal to the top, and as metal can enter only by the feeder, all danger of air bubbles is eliminated and the cast is perfect.

Willys-Knight Using Lanchester Balancer

Installed by Arrangement with Inventor—Other Changes Are Made in Engine

DETROIT, Aug. 20—All Willys-Knight engines are now being equipped with Lanchester vibration balancers which automatically compensate for the secondary unbalanced forces present in a four-cylinder power plant. The device is being installed by arrangement with its inventor, Dr. F. W. Lanchester, a British engineer.

In addition changes have been made in the location and size of the ports in the sleeves, which together with a slight increase in the compression ratio have increased the torque of the engine at low speeds.

Open models are now being equipped with 33 x 4.95 and closed models with 33 x 5.77 balloon tires. An option of five 32 x 6.20 balloon tires and five disk wheels is offered at an additional cost of $100 on the standard open models and of $80 on all others. No change in prices from those published in AUTOMOTIVE INDUSTRIES of Aug. 14 has been made.

First Sales Congress Scheduled by N. A. D. A.

ST. LOUIS, Aug. 20—Officials of the National Automobile Dealers' Association have decided to go ahead with the plan for the national sales congress at Atlantic City, N. J., Sept. 29-30, and the program has been completed. The dates as finally fixed are one week later than originally planned when the N. A. D. A. asked the National Automobile Chamber of Commerce for financial cooperation in the sales congress program.

It is expected that the N. A. C. C. directors at their September meeting will decide on whether or not they will come in on the plan to spend $50,000 in a series of sales congresses to be conducted by the N. A. D. A. If the decision is favorable, it will be possible to follow up the Atlantic City meeting with other meetings in different cities throughout the country as planned by the N. A. D. A.

Retail Car Deliveries Increase in Michigan

DETROIT, Aug. 20—Deliveries to owners of passenger cars in the State of Michigan in July totaled 19,173 as compared with 18,051 a year ago and 16,476 in June this year. Trucks delivered to purchasers totaled 1594 which compares with a total of 1558 in July last year and with 1313 delivered in June this year.

Ford car sales in July were 9438 or about 49 per cent of the total. Combined with other cars in the low priced field the total sales in this division were 67 per cent. Cars in the $1,000 price class and under made up 81 per cent of the total volume in the State, the medium priced class getting 16 per cent and the balance to the high priced field.

Of the month's total business of 19,173 cars, all but 187 of these were delivered by 30 manufacturers. This shows a considerable concentration of the business in the hands of fewer makers over the last year's period, though it is noteworthy that two of the leading companies numbered among the 30 were not manufacturing at this time last year.

Of the total truck volume of 1594, 1016 were Ford. Light trucks led by Ford were considerably in the ascendancy, though there was a good volume of heavy duty business. Ford truck volume was 33 under July of last year, the gains for the month being scattered among other makers. Miscellaneous truck sales showed an increase over last year.

M. W. Bartlett Elected as Head of Splitdorf

NEWARK, N. J., Aug. 21—M. W. Bartlett was elected president of the Splitdorf Electric Co. yesterday to fill the vacancy caused by the death of John F. Alvord. Mr. Bartlett has been vice-president and general manager for several years.

Concerning the petition in bankruptcy filed by Harry D. Halsey, a stockholder, President Bartlett said:

"The affairs of the Splitdorf Company are in excellent shape, as was brought out at our general meeting yesterday. We are perfectly solvent, and our assets are twice our liabilities, without including the valuation on land and buildings."

New York Sales Showed Good Recovery in July

NEW YORK, Aug 19—Recovery from the June depression in the Metropolitan district took place in July, according to statistics compiled by Sherlock & Arnold, publisher of the Automobile Sales Analysis. Registrations of new cars in July aggregated 12,043 as compared with 9605 in June. Total sales for the first seven months of this year amounted to 64,022 as against 60,177 in the same period last year.

Recapitulation for the seven months of 1924 follows:

	Medium and Low Priced	Higher Priced
January	3,548	292
February	3,814	357
March	8,179	674
April	12,133	972
May	11,597	808
June	8,996	609
July	11,376	667
Total	59,643	4,379

In the low and medium priced field, four cars report sales of more than 5000 for the seven months of this year, three others in excess of 2000 and eight others of more than 1000. Two makes of cars continued to hold the lead in the higher priced field.

Tire Demand Better, Says Seger of U. S.

Substantial Improvement Noted and Outlook Is Good for Its Continuance

NEW YORK, Aug. 20—"The tire business of the company has shown a very substantial improvement, and, in spite of materially lower prices, the results for the first six months have more than justified the hope expressed in the annual report for last year. The outlook for a continuance of this improvement is very encouraging," says C. B. Seger, chairman of the board of the United States Rubber Co., reporting to his stockholders on operations for the first half of the year.

Mr. Seger states that the company's sales of rubber products in the period amounted to $77,774,696, a decrease of $9,935,509 compared with the corresponding period of last year, due in part to lower selling prices, but principally to general business conditions. Net income before interest, but after charges, amounted to $7,510,415; interest on the funded debt to $2,360,200, and all other interest $727,728, a total of $3,087,928, leaving net profits of $4,422,487 for the period. This compares with $4,572,861 for the first six months of 1923.

$127,116,000 Current Assets

Current assets amounted to $127,116,000, as compared with $125,058,000, consisting of $50,017,000 in cash and accounts receivable, and $77,099,000 in inventories.

"The seasonal nature of the company's business necessitates accumulating stocks in the first six months of the year to meet heavier shipments to be made during the remaining months," explains Mr. Seger. "This results in inventories being at their highest point about the middle of the calendar year."

Maker of Wheels Denies Purchase Forms Monopoly

WASHINGTON, Aug. 20—Acquiring the whole of the stock or share capital of a competing company—the Forsythe Bros. Co.—with the effect of substantially lessening competition and creating a monopoly in the automobile wheel industry is charged by the Federal Trade Commission in a citation directed to the Motor Wheel Corp. of Lansing, Mich.

DETROIT, Aug. 19—Officials of the Motor Wheel Corp. have not received formal notice as yet of the filing of charges before the Federal Trade Commission. Substantially the company's position in reference to these charges, it is stated, is simply that competitive conditions have been affected but slightly and that there is no basis for the charges brought.

Hoover Patent Suit Passed on by Court

Decision in California Won by American Chain—Notice Given of An Appeal

SAN FRANCISCO, Aug. 18—Finding for the American Chain Co. in its suit against the Chester N. Weaver Co. under the Hoover patent, No. 1,191,306, owned by the American Chain Co., Judge Benjamin F. Bledsoe in the United States District Court, Northern District of California, holds that the invention covered by this patent antedates that of Lyon as shown in Patent No. 1,198,246, and that the type of Lyon bumper involved in this suit, therefore, infringes the Hoover patent.

Counsel for the defense has given notice that the case will be appealed and carried to the United States Circuit Court of Appeals for the Ninth District.

Brilliant Array of Legal Talent

The suit was brought against the Weaver company because it was selling Lyon bumpers made by the Metal Stamping Co. of New York, patents on which are owned by Lyon & Wilson. The case has been hard fought, with a brilliant array of legal talent on both sides, the American Chain Co. being represented by Frederick S. Duncan of New York and Charles E. Townsend and John H. Miller of San Francisco, while the defense has Drury W. Cooper of New York, William W. White, Carey Van Fleet, Senator Samuel M. Shortridge and William G. McAdoo. The case was heard by Special Master Harry M. Wright, whose first finding held that the Lyon bumper infringed the Hoover patent. The case was reopened later, but again the special master upheld the Hoover claim.

The present decision of Judge Bledsoe is an approval of the master's report.

There can be no doubt in my estimation but that Hoover's invention, insofar as it related to a continuous resilient spring bumper effect, was both entirely novel and exceedingly useful, Judge Bledsoe says in his decision. Its novelty and merit entitle it to a reasonably substantial range of equivalency. That it is infringed by the defendant's device, plural in members but unitary in structure and effect, is equally clear. I do not discover any equities in defendant's case, as contended for, sufficient to invalidate plaintiff's cause of action.

Takes Up Priority Question

Touching on the remaining question as to priority of invention and reduction to practice as between Hoover and Lyon, Judge Bledsoe held that the former antedated the latter in "reduction to practice."

Said Judge Bledsoe:

All in all, I am of the deliberate conviction that the testimony of Hoover to the effect that he did reduce this invention to practice in 1910, as claimed by him, is sustained by the corroborative proofs and sufficiently meets the burden imposed upon him under the decision in the Willard case. The findings of the special master as upon evidence, together with his report and recommendations as to the validity of the Hoover patent are approved. In conformity therewith, and in furtherance thereof, a decree containing the usual provisions, to be prepared by the plaintiff's counsel, will be entered as record.

Sees Conflict in Decisions

NEW YORK, Aug. 20—Referring to the California decision in the American Chain Co.-Chester N. Weaver Co. case, John F. Galvin, president of the Metal Stamping Co., declares that the attorneys for the defense have been instructed to carry the case to the Circuit Court of Appeals in the California district.

"In the event that that court sustains the decision of the lower court," said Mr. Galvin, "the case will be carried to the United States Supreme Court, as such decision would be in conflict with the one rendered by the United States Circuit Court of Appeals, New York District, in 1918, in the suit of the Metal Stamping Co. against the Hartford company, in which decision the Lyon patent was upheld.

"I might add that the decision affects only the old type of loop-end bumper, which has been almost entirely replaced by the parallel bar type now in general use."

Final Figures for July Put Output at 262,876

WASHINGTON, Aug. 21—The report of the Department of Commerce on July automobile production shows a total of 262,876 cars and trucks. This is slightly higher than the estimate of 258,200 made by the National Automobile Chamber of Commerce, but practically the same as the figures quoted in the unofficial survey made in the first week of August by the Class Journal Co. representative.

The department states that the July production total consisted of 237,652 cars and 25,224 trucks.

Production for this year as reported by the department is as follows:

Passenger Cars	1924	1923
January	287,353	223,822
February	336,374	254,782
March	348,356	319,789
April	337,045	344,661
May	279,447	350,460
June	217,927	337,442
July	237,652	297,413
Trucks		
January	28,925	19,732
February	31,153	22,173
March	34,118	35,284
April	36,156	38,085
May	33,411	43,730
June	27,863	41,173
July	25,224	27,863

HOWARD D. WILLIAMS DEAD

DETROIT, Aug. 20—Howard D. Williams, manager of the Detroit office of the Ferry Cap & Set Screw Co., is dead of influenza-pneumonia, following a short illness. Mr. Williams had been associated with the Ferry company since 1917.

Total Ford Dealers Now Number 13,922

Represents Increase of 831 During Year—Three New Companies Organized

DETROIT, Aug. 19—Authorized Ford dealers throughout the world now total 13,922, an increase of 831 during the last year, the Ford Motor Co. says in an official statement. Expansion of foreign sales and service organizations has reached record proportions this year with the establishment of three new companies and a branch.

The three new companies established abroad during the year are at Stockholm, Rotterdam and Port Elizabeth, South Africa, the last named being an offspring of the Ford Motor Co. of Canada, Ltd. The new branch is at Santiago, Chile. These new companies bring the total of foreign incorporations to 11, and there are 12 branches. Eight of the branches are of the Canadian company, all these but the Port Elizabeth branch being in Canada.

There is a slight distinction in the ownership of the foreign branches of companies. The branches are owned by the Ford Motor Co., the foreign companies being owned by the Ford family, but operated by the company. The Ford Company of Canada is a stock company in which the Fords hold a principal interest, the branches of this company being owned and operated by it.

Operating in what is practically virgin territory, the Santiago, Chile, branch is now represented by 35 dealers in widely scattered parts of that country, the company says. Cars are partially assembled there and body assembly work is under way. The Stockholm company controls 133 dealers in Sweden and Finland now selling more than 100 cars a month. This plant completes assembly of knock-down cars shipped from Copenhagen. Foreign cities in which there are establishments are Antwerp, Barcelona, Bordeaux, Copenhagen, Cork, Manchester, Rotterdam, Stockholm, Trieste and Ford, Ont.

Branches are in Buenos Aires, Havana, Montevideo, Santiago, Sao Faulo. Ford of Canada branches are at Calgary, London, Montreal, Toronto, Regina, Vancouver and Winnipeg in Canada and Port Elizabeth, South Africa.

Indiana Registration Fell Slightly in July

INDIANAPOLIS, Aug. 20—Official registration records of new cars sold in Indiana during July show that there were 8109 sales, which compares with 8469 sold during June, a loss of about 4 per cent. Truck sales increased to 502 during the month, as against 466 for June. Compared with July sales in 1923, the current record shows a decrease of a little more than 12 per cent.

Dull Second Quarter Cut G. M.'s Earnings

Profits for the First Three Months Were Nearly Equal to Those of Last Year

(*Continued from page* 378)

The condensed consolidated balance sheet shows the following current and working assets and current liabilities:

Current and Working Assets

	June 30, 1924	Dec. 31, 1923
Cash	$30,552,452	$47,069,804
Marketable securities	9,094	9,817
Sight drafts and C.O.D. items	9,193,435	13,283,706
Notes receivable	3,779,560	3,452,273
Accounts receivable, etc.	14,088,404	15,820,019
Inventories	142,774,934	138,678,131
Prepaid expenses	1,074,194	1,587,532
Total	$201,472,076	$219,901,286

Current Liabilities

	June 30, 1924	Dec. 31, 1923
Accounts payable	$19,530,084	$40,299,518
Notes payable	.....	10,000,000
Taxes, payrolls and sundries accrued, not due	23,022,141	19,430,546
Federal taxes	7,259,868	8,272,586
Accrued dividends	1,154,045	1,148,054
Total	$50,966,140	$79,150,704

Details of the consolidated income account for the first half of 1924 compared with the corresponding period last year are as follows:

	1924	1923
Cars and trucks:		
Retail deliveries	379,590	408,985
Sales to dealers	353,099	397,181
Net sales, value	$314,426,234	$362,819,353
Profit from operations and investments, after deductions	$41,314,234	$58,311,111
Depreciation	8,003,098	7,204,972
Net profit	$33,311,135	$51,106,139
Less: Provision for employee's bonus	652,000	2,630,000
Due Managers Securities Co.	652,000	.....
Employees' fund	1,070,328	940,769
Interest on notes payable	285,198	310,499
Total	$2,659,527	$3,881,269
Balance	$30,651,608	$47,224,869
Less: Federal taxes	3,370,000	5,483,000
Net income	$27,281,608	$41,741,869
Gen. Motors proportion net income	$27,066,989	$41,585,600
7% debenture div.	$1,152,627	$1,097,004
6% debenture div.	1,824,030	1,823,929
6% preferred div.	485,502	485,163
Total	$3,462,159	$3,406,096
Earned on common stock	*$23,604,830	*$38,179,504
*Note: If Gen. Motors' equity in undivided profits of Fisher Body (60%) and Gen. Motors Acceptance Corp. (100%) were included, amount earned on common stock would be	$28,600,700	$45,003,203

SURPLUS ACCOUNT

Surplus over and above $10 per share of no par value common outstanding at beginning of period	$120,699,299	$89,936,863
Addition arising from excess over $10 per share of no par value common issued for employees' bonus	.....	354,308
Amount earned on common stock, as per income account	23,604,830	38,179,504
Total	$144,304,129	$128,470,675
Less: Cash dividends paid on common stock March 12, 30c. share	6,193,073	6,150,585
June 12, 30c. share	6,193,090	6,121,491
Total	$12,386,164	$12,272,076
Surplus over and above $10 per share of no par value common outstanding	$131,917,965	$116,198,598

Hudson and Essex Sales Exceed All of Last Year

DETROIT, Aug. 20—Sales of Hudson-Essex cars so far this year are 94,362 as against 88,188 for all of last year. With production on both models now going at a rapid rate, the 100,000th car of the year will be manufactured about Sept. 1, Hudson Motor Car Co. estimates. The plant is working at capacity, with some departments working nights.

Increase over last year's business has been around 30 to 35 per cent on the Hudson models, while the company estimates that twice as many Essex will be built this year as last. A statement on the general business situation by the company says:

Business conditions are most encouraging. Many large districts in the United States are now in the market actively for cars which have not been purchasers in any volume for several seasons previously. The feeling of an inevitable slowdown, which was so prevalent a few months ago, is disappearing and we are entering into the harvest time of the year.

An increase in buying will bring in the familiar circle of increased employment, greater business activity. There is a disposition everywhere to do business. We are getting into a period of well balanced values and really normal business, with a good volume of trade for those who have what the public wants. The public does not want novelty or frills; it wants useful service and value.

Higher Taxes Opposed by Gasoline Companies

LOS ANGELES, Aug. 20—Indications are that the California oil companies will oppose the proposed increase in the gasoline tax now being advocated by the State authorities. The tax now is 2 cents a gallon and an increase of 1 or 2 cents a gallon is advocated. Returns from the gasoline tax for the quarter ending July 1 amounted to about $4,000,000, an increase of more than $600,000 over the preceding quarter.

The opposition to the contemplated increase in tax is based on the fact that the more the tax becomes the less money will be spent for gasoline. A semi-official statement representing the viewpoint of the oil companies was to the effect there was practically no opposition to the original tax because of the small amount involved.

FINANCIAL NOTES

Stewart-Warner Speedometer Corp.'s balance sheet as of June 30, 1924, places the ratio between current assets and current liabilities at almost 7½ to 1, with working capital amounting to $7,824,368 as compared with $8,650,848 at the end of the first quarter. Net earnings for the second quarter are put at $512,850, equivalent to $1.07 a share on the 474,990 no par value shares outstanding with a deficit for the second quarter of $669,555 after dividends. This compares with a surplus of $296,249, after dividends, in the first quarter and a surplus of $926,570 in the second quarter, a record period, of last year. A large reduction was made in the company's accounts and notes receivable, the figure for the end of the second quarter being $1,294,472 as against $3,154,764 at the end of the first quarter and $2,739,186 as of June 30, 1923. Current assets are put at $9,067,781 and current liabilities $1,243,413.

Timken Roller Bearing Co. reports net income of $1,219,713 after depreciation, taxes, etc., for the second quarter. This is equivalent to $1.01 a share on the 1,200,192 shares of no par capital stock outstanding, as compared with a net income in the first quarter of $1,826,778, or $1.52 a share on the same amount of capital stock. Net income for the half was $3,946,491, after deductions, or $2.53 a share.

Lee Tire & Rubber Co. reports a net loss of $39,347 for the second quarter, after expense and charges, compared with a deficit of $112,217 for the preceding quarter. Net sales were $3,395,943 as compared with $3,266,591 in the preceding quarter. Net income was $6,501 but interest charges, etc., of $45,848 brought about a deficit.

Paige-Detroit Motor Car Co.'s first half netted profits of $1,854,696 after interest, etc., but before Federal taxes. This is equivalent to $3.09 a share (par $10) earned on the outstanding 600,000 shares of common. Surplus after common dividends was $1,494,697, with profit and loss surplus $1,704,147.

Doehler Die Casting Co. shows net profit of $178,194, after expenses and interest, for the first half. This is equivalent to 95 cents a share on 150,000 shares of no par common after allowing for preferred dividends. Net sales totaled $3,272,268, with costs of $2,869,403, leaving an operating profit of $402,865.

Vesta Battery Corp. has declared the regular quarterly dividend of 1¾ per cent on preferred, payable Sept. 1 to stock of record Aug. 20.

Keystone Tire & Rubber Co. reports a deficit of $175,432, after reserves and other adjustments, for the first half. In the same period last year the deficit was $182,170.

$28,700,000 Being Spent by Texas on New Roads

WASHINGTON, Aug. 22—Texas has more than 2000 miles of State highways under construction, according to the reports received by the United States Bureau of Public Roads. This includes 146 miles of concrete and brick pavements, 425 miles of asphaltic pavements, 1190 miles of gravel and macadam roads and the remainder sand-clay, shell and earth roads. This large program is estimated to cost about $28,700,000.

Changes Being Made in Chicago Coliseum

Parts and Accessory Exhibits Will Be Benefited by Improvements Under Way

NEW YORK, Aug. 20—The management of the national shows in New York and Chicago, in stressing the importance of the parts and accessory exhibits, is making plans to give the equipment end of the industry a greater opportunity than ever before to display its products. With this end in view, changes are being made in both the Bronx Armory in New York and the Coliseum in Chicago that will aid materially in bringing this about.

Conferences between S. A. Miles, N. A. C. C. show manager, and Neal G. Adair, manager of the show department of the Motor and Accessory Manufacturers Association, have been followed by the announcement that the Chicago show will see a big rehabilitation so far as the equipment exhibits are concerned. The Coliseum gallery is being reconstructed on the Wabash Avenue side, the second floor of the South Hall (the old Annex) is being completely redecorated, while in the new North Hall the gallery will be given over to parts and accessories.

As a result of the changes in the Coliseum gallery there will be a height of seven feet at the rear, which will tend toward greater comfort for exhibitors who in the past have been cramped by what might be called a low ceiling. The new North Hall will have 103 ft. frontage on Wabash Avenue, running back 167 ft. and around three sides will be a gallery topped by a level roof with 13½ ft. head room above all exhibits. An aisle will go around the gallery, with exhibit spaces on either side. Parts and accessory exhibit floors of the North Hall, Coliseum and South Hall will be connected on one level, making it possible for the show crowds to make a complete circuit.

Arrangements have been made to erect illuminated signs on the main floors where cars will be exhibited, pointing the way to the parts and accessory exhibit.

In the Bronx Armory, New York, all the parts and accessory space places for the crowds.

Foundrymen Will Hold Convention in October

MILWAUKEE, Aug. 20—Elaborate preparations are being made by Milwaukee members of the American Foundrymen's Association for the twenty-eighth annual convention and exhibition at the Auditorium in Milwaukee, Oct. 11-16.

Milwaukee entertained the convention in 1918, shortly before the signing of the armistice. This will be the first convention held west of Ohio since that time and second since 1914, and the location is especially advantageous to members of the industry in the Middle and Far West.

It also is pointed out that Milwaukee is the sixth city in the United States in point of number of foundries, and it ranks with the first in the extent and character of its foundry activities, among which automotive castings, forging billets, forgings, die castings, etc., assume an imposing position.

INDUSTRIAL NOTES

Locomobile Co. of America has rearranged its production methods at its plant in Bridgeport, Conn., moving the assembly line from the Liberty building and concentrating all chassis assembly in the main building. Body manufacturing and designing is confined to the second floor of the main factory building and all machining and metal manufacturing operations are confined to the new Liberty building.

Henry A. Poppert & Son Co., Milwaukee, a pioneer manufacturer of brass and aluminum castings, die castings, wood and metal patterns and dies and operating also a custom machine shop, has purchased the plant erected for the Bull Dog Tractor Co. at Fond du Lac, Wis., and will retool at once for his purposes.

Robert Bosch Magneto Co., Inc., New York, has increased the space of its executive offices 100 per cent and in addition has taken over the entire eleventh floor at 123 West Sixty-fourth Street, its headquarters. The engineering laboratory and testing department will remain on the twelfth floor.

H. B. Kendal & Co., General Motors Building, Detroit, have been appointed factory sales representatives for the Detroit territory by the Federal Pressed Steel Co., handling bumpers, brake drums, torque tubes, housings and other heavy stampings.

Annual Safety Congress Is Dated for Louisville

CHICAGO, Aug. 18—Plans made by the National Safety Council for its thirteenth annual safety congress, to be held in Louisville, Sept. 29-Oct. 3, call for 275 speakers, including Secretary of Commerce Herbert Hoover and Secretary of Labor James J. Davis. Motoring interests will be represented by Ernest N. Smith, general manager of the American Automobile Association, and C. F. Kettering, president of the General Motors Research Corp.

Representatives of the A. A. A., National Automobile Chamber of Commerce and the International Chiefs of Police Association will be brought together in the public safety program. There will be a special street and highway exhibit, consisting of records and charts, signs and signals, etc., used in street traffic control and regulation and public safety work.

STOPS MAKING TRACTORS

MANSFIELD, OHIO, Aug. 18—The Aultman & Taylor Machinery Co., veteran manufacturer of farm machinery, has sold out and discontinued all manufacturing operations on the various models of "Aultman T" tractors.

METAL MARKETS

Approaching the period in which a broadening of the demand may be reasonably looked for, the steel market is gradually overcoming its weak spots. Producers of bolts and nuts have ceased cutting prices and are preparing consumers for an advance. Large automotive consumers, who so far experienced little difficulty in placing orders for their steel requirements at their own bids, are beginning to notice greater firmness on the part of sellers. Cold-finished steel bars are held at the 2.80c. base price, although gossip has it that the leading low-priced passenger motor car builder recently placed an order at $1 a ton below that level.

Following sales of cold-rolled strips at as low as 4c., Pittsburgh, the market is now rather uniform on a 4.25c. basis. The cold-rolled strip market is feeling the untoward effect of the recent downward readjustment of full-finished automobile sheet prices which make sheets highly economical for fender stock. With the sheet rollers improving their rate of operations daily, and price levels fairly low, it is quite likely that sheet prices will respond fairly prompt to any marked expansion of the demand.

Since the leading interest has seen fit to meet the 4.75c. quotation for full-finished automobile sheets, the market is on the same basis as it was in August, 1922. September of that year brought an advance of $2 a ton, the 4.85c. price continuing throughout the remainder of 1922. Sheet bars, while quoted nominally at $38, could probably be purchased at $1 less. When the ragged condition of the sheet bar market gives way to more normal conditions, its effect on the sheet market will be immediate. At times untoward conditions in the semi-finished market exert a strong influence on the sheet situation, and at others sheet bar prices soften under the influence of lack of orders from the non-integrated sheet rollers. Alloy steel billets are now being rerolled, whereas formerly they were given only a single rolling. As a result, the differential between billets and bars has been wiped out. Billets, however, will continue to be quoted in gross tons and bars in net tons.

Pig Iron.—Modest improvement is noted in the demand from automotive melters, but consumers in other industries have entered the market and, as a result, a much stronger tone is in evidence.

Aluminum.—While most consumers are taking only enough metal to carry out production schedules, some interest is beginning to be shown in contracts for longer deferred deliveries. Some foreign aluminum which was intended for the American market remained in England when the demand there became urgent. Conditions in the London market have returned to normal by this time. Berlin reports state that the three leading producers of Germany are sold out for many months ahead, but are compelled to hold the metal they have sold for account of the buyers which are rolling mills because all of the latter are short of funds.

Copper.—To the better domestic consuming demand has now been added awakened speculative interest on the part of Europe, and copper seems now definitely to have left behind the doldrum stage. The possibility of fractional advances, followed by temporary recessions, must be reckoned with.

Calendar

SHOWS

Oct. 21-27—Transportation Show, Motor Truck Industries, Inc., American Exposition Palace, Chicago.

Nov. 9-15—New York, Annual Automobile Salon, Commodore Hotel.

Nov. 10-15—Chicago, Annual Show and Convention of the Automotive Equipment Association, Coliseum.

Jan. 2-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory. Trade attendance only, Jan. 2-3.

Jan. 23-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory. Trade attendance only, Jan. 23-24.

Jan. 25-31—Chicago, Annual Automobile Salon.

FOREIGN SHOWS

Aug. 23-Sept. 6—Toronto, Ont., National Automobile Show in conjunction with the Canadian National Exhibition under the sanction of the Canadian Automotive Equipment Association and the Automotive Industries of Canada.

September—Vienna, Austria, Vienna International Fair.

Sept. 13—Sao Paulo, Brazil, Annual Automobile Show.

Sept. 21-28—Prague, Czecho-Slovakia, Prague Autumn Fair.

Oct. 2-5—Dantzig, Second International Dantzig Fair, automobiles and allied equipment.

Oct. 2-12—Paris, passenger cars, motor cycles, bicycles and accessories, Grand Palais.

Oct. 17-25—London, Annual Passenger Car Show, Olympia.

Oct. 22-31—Paris, motor trucks, stationary engines, garage tools and machine tools, Grand Palais.

Nov. 9-19—Buenos Aires, Annual Automobile Show, Pabellon de las Rosas, under the auspices of the Automovil Club Argentino.

Dec. 1-13—Montevideo, Uruguay—Second Annual Motor Show, under the auspices of the Centro Automovilista del Uruguay, held in buildings of the Asociacion Rural del Uruguay.

RACES

Sept. 1—Altoona.

Sept. 1—Syracuse.

Sept. 7—Monza Track, near Milan, Italy, Italian Grand Prix.

Oct. 2-4—Dayton, Ohio, Fifth Airplane Race for the Pulitzer Trophy.

Oct. 4—Fresno.

Oct. 19—Kansas City.

Nov. 24—Los Angeles.

CONVENTIONS

Sept. 17-20—White Sulphur Springs, W. Va., Annual Meeting of the Automotive Electric Association, Greenbrier Hotel.

Sept. 19-20—Niagara Falls, N. Y., National Battery Manufacturers Association.

Sept. 22-26—Boston, Sixth Convention and International Steel Exposition of the American Society for Steel Treating.

Oct. 15-17—Cleveland, Fall Convention of the Motor and Accessory Manufacturers Association.

Oct. 16-18—Briarcliff Manor, N. Y., Semi-Annual Meeting of the American Gear Manufacturers Association, Briarcliff Lodge.

Jan. 5—New York, Convention under the auspices of the National Automobile Dealers Association, Hotel Commodore.

Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

S. A. E. MEETINGS

Sept. 18-19—New York City, S.A.E. Automotive Transportation Meeting.

Oct. 22-24—S. A. E. Production Meeting, Detroit.

Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland.

Oct. 2—Aeronautical Meeting at Dayton at the time of the Pulitzer Races.

Jan. 20-23—S. A. E. Annual Meeting, Detroit.

Germany Undecided on Lifting Embargo

WASHINGTON, Aug. 20—Predictions that Germany will shortly remove the import restrictions on automobiles have been received by the Tariff Division of the Department of Commerce from Assistant Commercial Attaché F. W. Allport at Berlin.

The German Automobile Dealers Association is reported to have resolved upon a vigorous campaign to bring about the removal of existing import prohibition on automobiles, without an increase in the import duties.

In May of this year it was indicated, according to cables sent the Department, that a removal of the import restrictions on automobiles might take place in October coincident with an increase in import duties. At that time, however, there was strong opposition on the part of the German automobile manufacturers toward the opening up of the German market to American automobiles.

This opposition on the part of the manufacturers is still being asserted, but is being overcome by the larger organization of German automobile dealers, with the result, it is predicted by Mr. Allport, that the market for American-made automobiles in Germany will again be open. No indication of the probable date of removal of the restrictions is contained in the cable.

DEPENDABLE TRUSTEE NAMED

GALESBURG, ILL., Aug. 19—Crescent O'Connor, Wataga bank cashier, has been named trustee for 30 creditors of the Dependable Truck Co. of this city. Mr. O'Connor will sell the property as soon as he has completed an inventory, and although creditors expect to share in the receipts of the $10,000 worth of machinery and equipment, they will get little from the plant sale inasmuch as the mortgage on it has already been foreclosed and there remains but an equity of about $1,500. Jerry Harn represented a group of former employees who took first action against the defunct concern to protect their wage claims, which are a prior lien upon the assets.

Better Conditions Seen Through Eastern Section

DETROIT, Aug. 20—Business conditions in the East are on the upward trend, and there is every indication that the fall season will see a much improved industrial situation and a strong buying market. This statement was made by Henry W. Burritt, general manager of Gray Motor Corp., following a trip through the eastern section.

Assured of exceptional crops and with the political situation fast smoothing itself out, together with favorable European news, American business conditions are bound to improve greatly within the next few months, he said. The automobile industry will be among the first to feel the improvement in general conditions, he said.

AMERICAN STEAM SOLVENCY

ELGIN, ILL., Aug. 19—Formal order declaring the American Steam Truck Co. of this city insolvent has been prepared for Judge Cliffe in the Federal Court by Harry A. Parkin, referee in bankruptcy. Assets are listed at $75,000, and liabilities $141,000. The involuntary bankruptcy proceedings were inaugurated April 10. The company was organized last year for the manufacture of steam-driven trucks.

Cord Tires Showing Gain in Production

NEW YORK, Aug. 20—Cord tires continue to gain in favor at the expense of fabrics, according to statistics compiled by the Rubber Association of America. June figures show that in comparison with the same month last year cords increased in production 14.5 per cent and shipments 48.5 per cent, while fabrics decreased 49.4 per cent in production and 38.8 per cent in shipments.

In June 2,031,002 cords were produced and 2,001,113 shipped, of which 1,530,872 were high pressure and 500,130 balloons produced, as against 1,683,898 and 317,215 shipped. With fabrics, 598,740 casings were produced and 752,030 shipped. Inventory totaled 6,155,537 in that month, production 2,629,742 and shipments 2,753,143.

June inventories included 4,302,284 cords and 1,853,253 fabrics, in comparison with 4,279,419 cords and 2,033,774 in May. In the case of the latter this is a decrease of 8.8 per cent and with the former an increase of 0.5 per cent.

Figures for Six Months

The total for the first half of the year shows 18,901,464 casings of all types produced and 17,202,622 shipped.

Reporting on the second quarter, the association finds that the total sales value of automotive rubber products shipments was $139,899,000, in comparison with $133,652,000 in the first quarter and $142,818,000 in the second quarter of 1923. This required the use of 56,323 tons of crude rubber, as against 65,253 in the same period last year.

As of June 30, there was a grand total of 64,418 long tons of crude on hand and 24,480 afloat.